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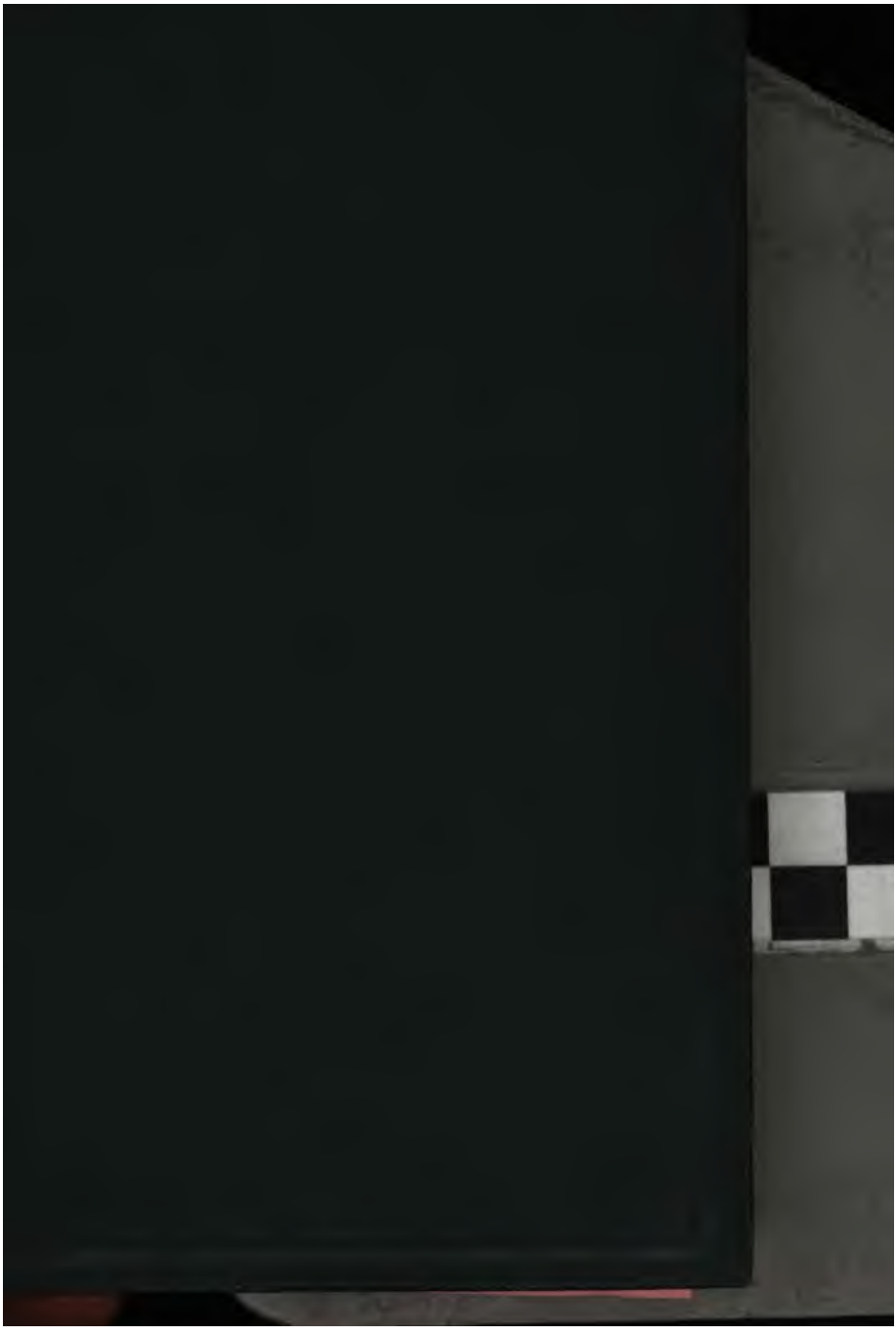

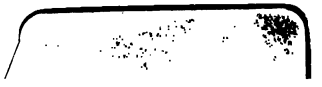

# MAN

## WHERE, WHENCE, & WHITHER ?

"In examining the history of mankind, as well as in examining the phenomena of the material world, when we cannot trace the process by which an event *has been* produced, it is often of importance to be able to show how it *may have been* produced by natural causes. Thus, although it is impossible to determine with certainty what the steps were by which any particular language was formed, yet if we can show, from the known principles of human nature, how all its various parts *might* gradually have arisen, the mind is not only to a certain degree satisfied, but a check is given to that indolent philosophy which refers to a miracle whatever appearances, in the material and moral worlds, it is unable to explain."—DUGALD STEWART.

# MAN

## WHERE, WHENCE, AND WHITHER

*BEING A GLANCE*

AT

*MAN IN HIS NATURAL-HISTORY RELATIONS*

BY

DAVID PAGE, LL.D. F.R.S.E. F.G.S.

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# PREFACE.

A SKETCH of the thoughts expressed in the following pages was given in two lectures to the Members of the Edinburgh Philosophical Institution in November 1866. Exciting considerable interest at the time, and receiving through the newspapers a wider audience than that to which they were originally addressed, these lectures, as might have been expected, met with a somewhat varied reception. By many the views they contained were adopted without reserve; by some, though not adopted, they were received in a spirit of candour and inquiry; while by a few the whole argument was met with the most vehement and unreasoning opposition. Had the last contented themselves with merely opposing—every man having a right to the free utterance of his opinions—the argument on the author's part might have terminated with the lectures; but as they re-

sorted, either ignorantly or intentionally, to misrepresentation, he has been constrained, in justice to himself and his subject, to prepare the following extension, and seek for his views a wider, and he trusts also a fairer consideration.

If the reader has not hitherto directed his attention to the natural-history relations of Man—to his origin, antiquity, and destiny—what follows may assist him in his considerations; if he has made the question a subject of research, and his views should coincide in the main with those of the author, he may glean from these pages some new facts to strengthen his convictions; and if, on the other hand, he has been led by early training to entertain opinions at variance with those herein expressed, a thoughtful perusal may induce him, if not to forego his preconceptions, at all events to review the evidence upon which they have been founded. This is all the author desires—the most he hopes for; his wish being to contribute his mite to that modern movement of mind which seeks to substitute inquiry for dogmatism, comprehensible methods for miracles, and rational convictions for traditional beliefs.

Though cursory—and intentionally so—these

chapters are given in strict connection, and the author would solicit from those who may turn to them the same sequence in perusal—a following of the argument from beginning to end and in the order enunciated. What appears unsatisfactory under one section may receive further elucidation under another, and what startles at the outset may be accepted without reserve at a future stage of the exposition. MAN'S WHERE, WHENCE, and WHITHER, are inseparably linked together, and there can be no intelligent appreciation of the one without a competent knowledge of the others—no successful dealing with one problem unless studied in connection with the other problems that arise from a philosophical consideration of the whole question of Man's place in nature.

EDINBURGH, *September* 1867.

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# INTRODUCTORY.

# INTRODUCTORY.

Nature and Importance of the Inquiry—General Unwillingness to approach it—Theological Opposition and Misrepresentation—Its Treatment as a Question of Natural History—Ultimate Object, Truth and Rational Beliefs—Bearing of the Inquiry on other Subjects of Research.

AT the present moment there are few scientific questions exciting so much interest as the origin and antiquity of man. And yet, general as the interest is, there is no subject so furtively studied and so unfairly dealt with. Impressed with certain theological notions, a large section of inquirers approach the investigation with restraint and distrust, while even in many of our learned societies an uneasy tenderness prevails the moment it is announced for discussion. Plant-life and animal-life in its lower phases may be investigated and generalised upon with any amount of freedom; but, strangely enough, the study of man, who at present crowns the biological system, is shirked as if it were impiety to approach it. It is true that anatomically most important knowledge has

been arrived at, but this more on account of therapeutic considerations than for biological conclusions. Physiologically too, great advances have recently been made in the determination of organic functions; and psychologically, writers are beginning to hazard something like a scientific opinion as to the relations that subsist between physical organisation and mental manifestations. But with regard to man's relations to the great scheme of life—his where, whence, and whither in the cosmical plan of continuity and progress—few have made them the subjects of earnest study, and still fewer have ventured to give expression to their convictions. It is only of recent years that the study of man has been recognised as an independent branch of natural science, under the title of Anthropology, and the only British institution for its furtherance—the Anthropological Society of London—is but a thing of yesterday. If not ignored in certain quarters, the investigation has at least been discouraged; and where not ignored it has been too much held in abeyance to popular prejudices and preconceptions. Such weakness, however, is far beneath the dignity of science; such restraints on free and rational inquiry can never be conducive to the interests of religion. Man in all his relations is intimately connected with external nature; and these relations, as bearing on his physical, intellectual, and moral

welfare, become not only legitimate but imperative subjects of research. The more man knows of nature and nature's methods, the less will he be inclined to disregard these methods; and the more he knows of nature and nature's laws, the higher his conceptions of creative wisdom and perfection. These laws and methods may be studied in connection with the inorganic world, or with the lower forms of organised existence; but they assume a higher interest and leave a deeper impress when viewed in relation to man—the place he holds, and the place he is destined to hold, in the great progressional scheme of creation. "Know thyself," is an injunction, physically and morally, as imperative on the race as it is on the individual.

It is of no avail to tell us, as some would vainly do, that man's chief business is with the present and the duties which lie before him in daily life, and that it is of little moment to him whether his race has inherited this globe for six thousand or for sixty thousand years, or whether he shall continue to inherit it in increasing or decreasing variety. We are compelled, by an irresistible impulse of our nature, to look backward to the past as well as to look forward to the future; and necessarily so, since the main business of the present is to draw from the past, that it may be prepared for the

future. The present is thus intimately connected with the past, as it is inseparably interwoven with the future, and cannot be fully understood unless in relation to what has gone before as well as to that which must inevitably follow. The great business of life—even that which lies most immediately before us—will be more fully understood and more rationally performed the better man knows the place he holds and the relations he bears to the plan of creation. Man's where has descended from his whence, and his whence and his where must indicate his whither. Where are we? Whence are we? and Whither are we going? are questions which incessantly force themselves upon our attention; and science merely seeks, with all humility and reverence, to arrive at a satisfactory answer. We cannot stem this desire for knowledge, because nature has made it necessary that we should know; and whatever light can be reflected from the past on the path of the present is a guide to the existing, just as every indication of the future, from a study of the past and present, must be an incentive to compliance with its requirements.

Man has no intuitive knowledge of his natural-history relations more than he has of other subjects. The beliefs by which he is influenced are ever relative to his knowledge, and the fuller his knowledge the more harmonious, therefore, the discharge of his rela-

tions. It is true we may not be always able to comprehend the relations which the Creator has established between us and the surrounding world; but this we can only ascertain after we have made the effort, and there were an end to all knowledge did we believe there was aught in nature incomprehensible or placed beyond the range of reason. Indeed, man's incessant efforts to know belie this conviction; and generally the more mysterious the phenomenon the more intense the curiosity to resolve it. However much it may be misrepresented and opposed, this is all that science aims at in the present inquiry. Its object is truth and rational beliefs; and unless our beliefs be founded upon reason, they are unworthy of the name, and become the mere crudities of ignorance and prejudice. The revelations of science may, and in the nature of things must, often be at variance with popular preconceptions; but variances of this kind need not give rise to hostility nor preclude conviction. Theologians may be startled by new discoveries in science, just as their predecessors were by the assertions of astronomy, but they are not on that account entitled to accuse men of science of scepticism and infidelity; nor, on the other hand, have men of science any right to retort on theologians the charge of dogmatism and bigotry because they are not prepared all at once to accept the new deductions. The

sceptic and infidel is he who refuses facts and rejects the conclusions of enlightened reason; the dogmatist and bigot is he who, overestimating his own opinions, undervalues those of others and obstinately resists all conviction. What may be accepted by one mind under the bias of early training, may be insufficient to induce belief in another differently trained but equally earnest to arrive at the truth. "To faith," says Bunsen, "it is immaterial whether science discover truth in a spirit of scepticism or belief; and truth has been really found by both courses, but never by dishonesty or sloth."* Arguments may prevail; abuse never wins over converts. Bad words never make good arguments; and we may rest assured that he who is in the habit of using them is by no means in a fitting spirit to enter as a worshipper into the great temple of truth.

The subject to be considered in the following pages is one purely of natural history. We intend to inquire into the zoological, geographical, ethnological, and functional relations of man, which constitute his present position in nature, or his *where;* we go on to his historical, geological, and genetic relations, which indicate his origin or his *whence;* and knowing his past and present, science is surely entitled to speculate with some degree of certainty as to man's future,

* *Egypt's Place in Universal History*, vol. i. p. 164.

which forms his *whither* in the great cosmical scheme of continuity and progress. Man has his natural-history relations—of that there can be no gainsaying; and we merely seek to apply to the determination of these the same methods of research which by common consent are applied to the determination of the relations of other creatures. It is surely of some interest to man to know something of the origin, antiquity, and destiny of his race; of some importance to conform his practice in life to the relations which God has evidently established between him and the rest of creation. We have no intuitive knowledge of these; we seek to know them; and no statement will satisfy that fails to recommend itself to rational discernment. In dealing with topics such as these we have nothing to do with preconceived opinions. Scientific research must abide by scientific methods; scientific convictions must rest on scientific investigations. We appeal unto Cæsar, let us be judged by Cæsar's laws. It is true the subject is a delicate one, and requires delicate handling; but the interests of truth are always best secured by a candid utterance of beliefs, and whatever may be the value of these beliefs, there should at least be no faltering or hesitation in expressing what they are, or in stating the grounds upon which they are founded. In the words of Bishop Tait to the Edinburgh Philosophical In-

stitution in 1863, "The man of science ought to go on honestly, patiently, diffidently, observing and storing up his observations, and carrying his reasonings unflinchingly to their legitimate conclusions, convinced that it would be treason at once to the dignity of science and religion if he sought to help either by swerving ever so little from the straight rule of truth."

And, once for all, let it be observed, that if there be any irreverence in dealing with such questions as man's origin, antiquity, and destiny, that irreverence must rest with those who would circumscribe the range of reason, and seek by unworthy clamour to deter the human intellect from arriving at some conception, however faint, of those laws by which the Creator has chosen to sustain the phenomena of this marvellous universe. Man's relations to external nature, his relations to his God, and his relations to his fellow-men, determine at once the range of his knowledge and the sum of his obligations; and unless these relations be understood—and this is what science is always striving after—there never can be fulfilment of the duties they involve. It thus becomes truly pitiable to hear from certain quarters their misrepresentations of scientific aims and scientific conclusions. In fact, it is easier to bear than to hear them; and one can scarcely avoid the conviction

that those who can misrepresent the opinions of others in order to strengthen their own arguments, would have little hesitation in falsifying facts to subserve a similar purpose. They talk of religion and infidelity. There is no profession of religion more offensive than that which, under the assumption of superior piety, attempts to vilify the honest convictions of others; the "stand aside because I am holier than thou art," is in general as void of reality as it is wanting in Christian humility and charity. They talk of reconciliation between the utterances of science and religious beliefs, as if true religion and sound science ever have been or can be at variance. If religion means belief in certain dogmas and adherence to certain ritualistic forms, science and religion may often be in conflict; but if, on the other hand, the exercise of religion consists in search after truth, regard to the relations in which we are placed to the universe, and devotion to the Great Author of all, then science and religion are at one, and need no reconciliation.

We are anxious at the outset to place the question on a fair footing as regards its religious aspects, because men of science have hitherto been too much deterred from giving expression to their opinions through fear of incurring accusations of scepticism and infidelity. There is nothing more frequent than denunciations from the pulpit and platform against the

tendencies of modern science by men who are not only ignorant of the rudiments of science, but who have bound themselves by creeds and formulas before their minds were matured enough, or their knowledge sufficient to discriminate between the essentials and non-essentials of these restrictions. And here it may be remarked, once for all, that no man who has subscribed to creeds and formulas, whether in theology or philosophy, can be an unbiassed investigator of the truth, or an unprejudiced judge of the opinions of others. His sworn preconceptions warp his discernment; adherence to his sect or party engenders intolerance to the honest convictions of other inquirers. Beliefs we may and must have, but a belief to be changed with new and advancing knowledge impedes no progress, while a creed subscribed to as ultimate truth, and sworn to be defended, not only puts a bar to further research, but as a consequence throws the odium of distrust on all that may seem to oppose it. Even where such odium cannot deter, it annoys and irritates; hence the frequent unwillingness of men of science to come prominently forward with the avowal of their beliefs. It is time this delicacy were thrown aside, and such theologians plainly told that the scepticism and infidelity—if scepticism and infidelity there be—lies all on their own side. There is no scepticism so offensive as that which doubts the facts

of honest and careful observation; no infidelity so gross as that which disbelieves the deductions of competent and unbiassed judgments. There can be no reverence more sacred than that which springs from a knowledge of God's workings in nature; no religion more sincere than that which flows from the enlightened understanding of the methods and laws of the Creator. The more intimate our acquaintance with the works of God, the stronger our convictions of his power, wisdom, and goodness. The holiest beliefs are those founded on informed reason; all besides is little better than superstition and mechanical formality. It is of no use, then, when new questions like the present are mooted, for certain minds to work themselves into a frenzy of "orthodoxy"—to savagely smear themselves with theological war-paint, and raise the old war-whoop of the Bible in danger. These questions, whatever they may be, will be agitated and discussed, and men's convictions will ultimately take their hue from that which most commends itself to their understanding.

Be it then clearly understood that in investigating the natural history relations of man, we are dealing with a question of science, and striving to ascertain what light zoology, ethnology, geology, and the allied sciences, can throw upon his origin, antiquity, and destiny. We are merely seeking to apply to man

the same methods of research that are applied to the natural-history relations of other animals. What is the place he holds in the zoological scale? what is his distribution over the earth's surface? in what varieties does he appear? what are the functional duties he has to perform? how long does he seem to have tenanted this world? and, looking at his past and present relations, what seems likely to be the future destination of his species? Such are the problems which man's position naturally involves; such are the questions to which science is called upon to furnish a rational reply. Every assertion must be deduced from ascertained facts, and as such is a matter of probation which any qualified intellect can determine for itself. There is no mystery in scientific methods; nothing beyond the comprehension of honest and patient endeavour; nothing that earnest minds may not receive, and honest words fail to convey; and if it were otherwise, the bulk of scientific research would be in vain, and its dissemination hopeless. In the present case we shall endeavour to deal with matters of fact, and content ourselves with simply indicating the necessary deduction; and if this should recommend itself to reason, it becomes a truth—a belief as sacred as any other that may be entertained, and as such deserving the respectful consideration even of those who may hold a contrary opinion. If it be truth and

rational belief, no amount of opposition, from whatever quarter, can prevent its ultimate reception. As astronomy triumphed over the earlier notions respecting the earth's planetary relations, and geology over the views of its limited antiquity, so will science, so long as it is true to right methods, establish ere long more rational beliefs as to the origin, antiquity, and progressive ascension of mankind. In the meantime the battle has to be fought against prejudices and preconceptions; but the warfare will the sooner terminate the sooner that science gives unmistakable utterance to its convictions, and hurls back upon its opponents the unworthy weapons of their unavailing attacks.

As already mentioned, our object in the following pages is to discover what light modern science can throw on the relations which man holds to the rest of the universe. What the position, physical and intellectual, he now occupies? What the functions he has to perform? How or in what manner does he appear to have originated? What, geologically speaking, may be the measure of his antiquity? and what, deductively from the history of the past, seems to be the nature of the course that lies before him? These are clearly legitimate subjects of research; and so long as science abides by scientific methods, she is entitled to a fair hearing and respectful consideration.

The data may be few and doubtful and the results uncertain, still if they have been earnestly sought after and honestly interpreted, they are not to be despised. All knowledge is merely relative, and the more cordial the reception of the narrow information of to-day, the surer and speedier the attainment of the wider knowledge of to-morrow. Where the conclusions are sufficient to produce conviction, let the conviction be avowed; and where failing to induce belief, let them be received at least as well-meant and honest endeavours.

Nor is the investigation of man's where, whence, and whither without its importance to other subjects of scientific research. Archæology, ethnology, and history will derive confirmation or correction according to the conclusions arrived at; and much in the rise and progress of our race which is now irreconcileable under the ordinary views of chronology, may become easy of explanation under the establishment of a higher antiquity. Where history ceases, geology may assist the archæologist in the determination of primeval remains; and where ethnology is puzzled in tracing connections, palæontological discovery may sometimes contribute the necessary information. The establishment of a higher antiquity for the human race, and of an ascent from lower to higher varieties, would give ample scope to views on civilisation, the

development of new nationalities, languages, and religions, and lead to more satisfactory results in ethnology and history. Under a chronology of six or seven thousand years the rise and progress of the human race, with all its varieties, families, and nationalities—with all its languages, customs, and religions, seem impossible, perplexing, and confusing: under a wider range of time, the whole evolution becomes natural, comprehensible, and in accordance with what is now taking place around us. On these grounds, even if on no other, the subject would be worthy of research, and the results entitled to a fair and candid consideration.

We have said *in accordance with what is now taking place around us;* for, be it observed, there would be an end to all reasoning regarding either past or future if we did not believe in the general harmony, the even uniformity and permanence of the methods of creation. This belief is all essential to our inquiry; it lies, in fact, at the foundation of all satisfactory reasoning respecting the appointments of the universe, and without it we cannot proceed a single step in security. "It is true," says a recent writer,* "that this view of the government of the universe does not accord with the feelings of those who desire to have their attention directed in a definite manner to the repeated and

* *Physical Geography*, by Professor Ansted, pp. 442-3; 1867.

systematic personal intervention of a Divine Power, and who cannot recognise the power without being able to trace what is called the finger or the hand of the Creator in all his works. In a certain sense, no doubt, every contrivance, or in other words, every arrangement in the universe may be made to yield evidence of this. But we would venture to suggest that the noblest view of creation, and a knowledge of the real greatness of the Creator, can only be learned by those who seek to discover the much higher and nobler intelligence that designed the whole system. That there should be an interfering hand is a mark of weakness in the original plan. If the structure be perfect, interference is not necessary." And again, "All true science has for its object not only the observation of facts, but the investigation of methods and the discovery of laws. These laws can only be binding and unalterable because they cannot be changed with advantage; in other words, because they are perfect, as being instituted by One who is himself perfect."

But, independently of scientific considerations, archæological or ethnological, the subject has most direct and important practical bearings. Nations, like individuals, have their idiosyncracies and aptitudes. As one man has a genius for poetry and painting, and another a talent for mathematics and

mechanics; so one race has an aptitude for adventure and commerce, and another for the industrial arts; while a third may be incapable of rising beyond the lowest stages of nomadic existence. Clearly such races cannot be dealt with alike, and the more we know of national characteristics the better will we be prepared to direct our energies and shape our relations towards them. It is greatly for want of this knowledge that missionary and ameliorating schemes so often fail in their efforts, and that nation misunderstanding the character of nation drifts insensibly into contention and warfare. It is also for want of this knowledge that the civilisation and amalgamation of certain races has been tried in vain, and that the higher race has not unfrequently been absorbed into and debased by that which it sought to improve. In fine, the study of man—call it Ethnology, Anthropology, or what you will—is fraught with innumerable utilities; and whatever leads to more rational views of the duties and relations of race to race, and of nation to nation, is deserving of our warmest encouragement.

To some the treatment of the subject, within the limits I have assigned to myself, may seem cursory and inexhaustive; but to have exceeded these limits would have been to run the risk of defeating my object. It is an old saying that a big book is a great

evil; and an elaborate treatise on a matter as yet so little familiar might have been to deter from, rather than excite to, its study and comprehension. What I have aimed at is an outline rather than an array of details; a review for the general reader, and not an exhaustive argument for the man of science; a thing rather suggestive of what the question involves than instructive of truths already arrived at. My object has been to write as I would reason in conversation with a friend, earnestly and unreservedly; convinced that subjects of this kind will never be fully understood nor generally accepted till they are dealt with as great truths, which it is the business of every educated mind to endeavour to comprehend, and the duty of every man to explain to his less-informed neighbour. Where I have failed in disarming opposition, my plainness and directness of speech may prevent misrepresentation; and where I have not been successful in convincing, I trust at least that doubt has been awakened and a desire excited for fuller and more detailed information. And this, in matters at variance with olden opinion, is often all that can, at the outset, be attained. Men are in general slow to accept new views, and the first and most hopeful step towards this end is to induce them to question the soundness of their previous convictions.

# WHERE?

## ZOOLOGICAL RELATIONS.

Community of Life-conditions — Structural Affinity to other Animals—Ascent through Adaptive Modification—Principle of Variation ever operative—Mental Affinity to other Animals—Man Improvable and Progressive—Theory of Spiritual Community of Life—Our *First* Proposition.

MAN'S connection with the great scheme of animated nature is intimate and inseparable. The physical conditions under which life exists are the same to him as to other animals. Air, land, and water, heat, light, and moisture, are as essential to him as to the other forms and grades of vitality. He originates like other animals, embryologically passes through the same stages, and when launched on the field of independent being is subjected to the same functional round, and to the same struggle for existence. Life, growth, reproduction, and decay, are phases of being characteristic of all that lives. There may be differences in degree, as there are differences in form and function, but there is no exemption from these conditions and requirements. Man suffers thirst and hunger, heat and cold, pain and pleasure, much as other animals do. If he is stronger than some, he is weaker than others;

if in some of his senses he excels many, in this respect also he is inferior to others; and if in his general adaptations he is far superior, there are special instances in which he is greatly inferior. As a mere animal, then, man, like other animals, has his place in nature. It may be higher, but this is difference in degree not difference in kind; and it would be setting aside all philosophy in science to shrink from applying to him the same methods of research that are applied to the other forms that constitute with him the great brotherhood of vitality.

And yet, influenced by preconceptions as to man's origin and destiny, there are zoologists who would assign to the human species a place apart, and altogether of its own kind, in their schemes of classification, forgetful that the essentials of existence are the same to man as to other living beings, and forgetful also that almost all the great physiological laws and therapeutic considerations of modern times have been arrived at more perhaps from the investigation of vital phenomena in the lower animals than from their study in the human race. The truth is, the immense progress recently made in biological science has arisen chiefly from researches among the lower forms of vitality, and any attempt to separate man from the general scheme of life is stultified at once, and altogether apart from scientific considerations, by the

practical connection upon which anatomy and medicine are every day founding their procedure. All our views of comparative anatomy, of respiration, circulation of the blood, muscular and nervous action, embryology, and the like, are based upon the idea of oneness in the vital plan; and surely we cannot consistently separate in theory what the necessities of our every-day existence compel us to combine in practice.* If, then, we are compelled to regard man as belonging to the same brotherhood of life, we cannot, in dealing with his relations, adopt other methods of research or

* This oneness of plan, and its bearings on physiology and therapeutics, are well brought out in the following passage from the *Natural History of the European Seas*, by Edward Forbes and Godwin Austen :—"A great part of the animals that live beneath the waters consists of beings in a manner rudimentary—creatures exhibiting the elements of higher creatures, living analyses of higher organised compounds, the first draught of sketches afterwards finished, the framework, as it were, of many-wheeled machines. By an examination and study of them we get at a clearer conception of the nature of the structures which, in combination, constitute the complicated bodies of vertebrated animals, and in the end are enabled to throw light upon the organisation of man himself, learning thereby much concerning the wonderful construction of the microcosm, and at the same time, through our better knowledge of the nature and capabilities of our organisation, acquiring a lesser though more practical gain in the placing of the science of medicine on a surer and sounder foundation. The day has gone by when a medical student was taught the anatomy and physiology of man, with little reference to that of inferior beings."

follow any other than the ordinary line of biological argument. "But it is not upon structural similarity or difference alone," says the most experienced of living naturalists,* that the relations between man and animals have to be considered. The psychological history of animals shows that as man is related to animals by the plan of his structure, so are these related to him by the character of those very faculties which are so transcendant in man as to point at first to the necessity of disclaiming for him completely any relationship with the animal kingdom. Yet the natural history of animals is by no means completed after the somatic side of their nature has been thoroughly investigated; for they too have a psychological individuality which, though less studied, is nevertheless the connecting link between them and man. I cannot therefore agree with those authors who would disconnect mankind from the animal kingdom, and establish a distinct kingdom for man alone."

The slightest glance at the vital world is sufficient to convince that there is a great structural plan to which the whole of its component members are conformed, and that this plan is applicable alike to the extinct forms revealed by geology and to those still existing. One phase of this plan belongs to the globu-

* *Essay on Classification.* By Professor Agassiz, London, 1859.

lar or Protozoan forms, another to the rayed or Radiate forms, a third to the jointed or Articulate forms, a fourth to the soft-bodied or Molluscan forms, and a fifth to the backboned or Vertebrate. Whether these subdivisions are of equal zoological value we will not stop to inquire. It is enough for our present purpose to know that they form portions of the same biological scheme, and are bound together in plan by certain structural characteristics as well as by certain functional performances: by structural plan in the possession of corresponding organic parts, and by functional duty in the work of assimilation, growth, reproduction, and other processes peculiar to vitality. As man belongs to the highest, or Vertebrate section, it is with this that we have more especially to do; though we must not lose sight of the fact that section is connected with section by affinities which become closer and closer as we ascend from the lower to the higher and more specially organised, and that all really and truly belong to one great but multiform plan. Zoologically, indeed, it would not be difficult—were this the proper place—to show that the Radiate is but a permanent development of the temporary functional form of the Globular; the Articulate of the Radiate; the Molluscan a more concentrated expression of all three; and the Vertebrate a higher specialisation of the Molluscan; while each section is linked to the other by

intermediate forms which are either still existing or belong to bygone geological periods.

Man's structural connection with the vertebrate plan is inseparable; and while he is admittedly the highest form in the scale of created being, yet he is physically possessed of nothing that is not typified and existing in degree in the lower animals. Homologous parts of the vertebrate skeleton are common to fish, reptile, bird, and mammal—the fin to swim, the limb to creep, the wing to fly, and the hand to grasp. As we ascend the mammalian scale, the resemblance becomes closer and closer, till at last, in man and the forms immediately below him, we find organ for organ, bone for bone, muscle for muscle, and nerve for nerve—the resemblances, in fine, far more striking than the differences. There may be a process on a bone of the one more prominent than the process on the corresponding bone of the other; or there may be a section of the brain of the one less conspicuous than that in the brain of the other; but no honest and competent anatomist refuses on grounds like these to admit the identity of parts or the oneness of the plan upon which both are constructed.* Differences there

* "Not being able," says the most distinguished of British anatomists, "to appreciate or conceive of the distinctness between the psychical phenomena of a chimpanzee and of a Boschisman, or of an Aztec, with arrested brain-growth, as being of a nature so

undoubtedly are, but these are merely differences in degree—modifications of parts common to the whole rather than the creation or introduction of what is new and essentially original. Comparing the various orders and families of the vertebrate class, the lower with the higher, and the higher with those next above them, it seems that *adaptive modifications*, rather than independent and repeated creations, have been the governing method in structural advancement. As a skilful engineer models the primal idea of the steam-engine so as to adapt it for stationary, locomotive, or marine purposes, and this without inventing a new machine, so the original conception of the vertebrate skeleton is merely modified to suit it for the respective requirements of the fish, the reptile, the bird, and the mammal. And so in like manner it happens with the ordinal and generic differences that take place within the respective classes: they are modifica-

essential as to preclude a comparison between them, or as being other than a difference in degree, I cannot shut my eyes to the significance of that all-pervading similitude of structure—every tooth, every bone, strictly homologous—which makes the determination of the difference between *homo* (man) and *pithecus* (monkey) the anatomists' difficulty."—(Professor Owen "On the Characters, etc., of the Class Mammalia," *in the Journal of the Linnæan Society for* 1857.) And to the same effect the great Swedish naturalist admitted, now more than a century ago—"Nullum characterem adhuc eruere potui, unde homo a simia internoscatur."—(Linnæus, *Fauna Suecica.*)

tions of existing parts rather than the creation of new ones. Take, for example, the mammalian neck, which in all the orders consists of seven vertebral pieces. If this has to be lengthened for functional purposes, as in the camel and giraffe, the result is accomplished not by the insertion of additional vertebræ, but simply by a lengthening of each of the normal seven. If, on the other hand, it has to be shortened, as in the case of man, this is done not by the abstraction of one or more pieces, but simply by the compression of each of the normal number. Or take the mammalian fore-limb, with its shoulder-blade, arm-bone, forearm-bones, wrist-bones, and fingers. In this organ, whether it be the hand of man to manipulate, the claws of the tiger to tear, the foot of the antelope to spring, the hoof of the horse to run, the paddle of the whale to swim, or the wing of the bat to fly, it is clear that all are but modifications of the same primal parts—alterations for functional purposes, and not the creation of new and different members. As with the fore-limb, so with other organs. The plan upon which the mammalian type has been diversified, so as to produce its numerous orders, genera, and species, has been the modification of component parts, and not the creation of essentially new ones. And as with the mammalian, so with the other types that constitute the great scheme of life. In each, the respective

members are but modifications of the original type-forms, just as those type-forms themselves are modifications of a wider and more comprehensive plan.

It is true that modification of any important organ implies a corresponding modification in all the other organs which constitute the entirety of any living being. This is the great physiological doctrine of the "co-relation of parts" by which, for instance, the simpler stomach and shorter intestines of the carnivore is co-adapted to the trenchant tooth and seizing fore-limb, and the more complicated stomach and longer intestines of the ruminant co-adapted to the grinding tooth and the harmless fore-foot. No important modification, then, can take place in one member without affecting the others, and hence the numerous forms in nature according to the function to be performed and the element to be occupied.* But difference in form and function does not necessarily imply a separate origin, and seeing the gradual shading of form into form in nature, it is easier, and indeed more rational, to believe in modification of original type-forms than in the creation of new forms for every

* "Every organised being," says Cuvier, "forms a whole, a single circumscribed system, the parts of which mutually correspond and concur to the same definite action by a reciprocal reaction. None of these parts can change without the others also changing, and consequently each part, taken separately, indicates and gives all the others."

slight variation in habits and mode of life which the physical forces of the universe are ever producing. As external conditions are ever changing under the operation of physical forces, and this in conformity to established laws, so we may rest assured that variations in life-forms are equally the orderly results of secondary causation, though we may not in the present state of knowledge be able to indicate either the time when or the mode in which such causation may operate. Every anatomist, every breeder of animals, and every propagator of plants, knows that variations do take place—every palæontologist and fossil-collector perceives that similar variations have taken place; but neither in the existing nor in the extinct has the process been traced far enough, nor have sufficient data been accumulated to enable science to determine the full efficiency of this principle as a cause of specific and generic distinctions.

But though observation has not yet been enabled to complete the argument, there can be no doubt of the existence of the principle of variation, or of the important part it plays in the modification of life-forms; and we may safely accept it as one of the main factors in the law of biological development. Variation takes place so slowly, and by stages so minute, that ages may pass before it rises into what we are in the habit of calling "specific" distinctions;

and even where it may have culminated in species, observation has been so recent and so imperfect, that if no argument can be drawn from this source in favour of the doctrine of development, none, on the other hand, can be honestly advanced against it. If then there be a plan of *diversity by modification* running throughout the whole of nature—no matter what the causes—man, so far as his animal structure is concerned, can claim no exemption. He may stand higher, but his place is one merely of degree; and if he possesses any gift not participated in by his fellow-animals, it is to this specialisation, and not to his mere structural adaptations, that we must look for the difference that subsists between him and the rest of vitality. However averse some may be to accept this process of modification, as applicable to the evolution of the human race, there can be no question, at all events, that whatever the process, the same structural idea was in the Creative Mind in the formation of man as in the formation of other mammals, and more especially as in the production of those that stand next beneath him in the scale of zoological advancement. Nor be it forgotten that every progressive modification implies the addition of something new—the introduction through secondary processes, and in conformity with a great aboriginal plan, of higher adaptations, and consequently of

higher functional performances. In fact, the idea of development involves that of superaddition—no matter by what process the superaddition may be effected, and it is the oversight of this truth which apparently leads to the misconception of the theory of vital progression. Call it progressive modification, advancement, development, or what you will, there is clearly at each successive stage something new evolved; and as all physical means and processes are but implements of the Divine will, the new evolution must, in each case, be accepted as tantamount to a new creation.

If it should be argued, as it is sometimes done, that it would be as easy for the Divine Author of the universe to create a form of new as to modify the structure of a pre-existing one, then to such an argument there can be only one answer. No one doubts it; no one having enlightened conceptions of a Creator ever doubted it. But the question is not one of possibility but of probability. We perceive a certain order and certain method in nature; we see that under new conditions certain variations do take place in vegetable and animal structures; and by an irresistible law of our intellect, we associate the variations with the conditions in the way of cause and effect. Of such a method we can form some notion, and bring it within the realm of reason; of any other plan,

however it may be received, we can form no rational conception. Again, should it be advanced, as is sometimes done, that the creation of a monad is as incomprehensible as that of a man, then to this we decidedly answer, No. To argue otherwise were to maintain that the comprehension of a complex machine, composed of many wheels and levers, were as easy as the understanding of a single wheel or of a single lever. Scientific research on the cell-growth of vegetable and animal structures has made us acquainted, in some measure, with the development of these primary organisms, and how they are influenced by heat, light, electricity, and other forces. We can form some conception, however faint, of the simple uni-cellular germ, under the operation of these subtle forces; but of the complex structure of man by a similarly direct process, the human reason is utterly unable to conceive. We can follow, however, the successive stages of ascent, under a plan of development, and if we cannot fully explain the cause, we can indicate at least the process through which the modification was effected. And this, be it observed, is something gained—a step, however short, towards the solution of the problem of vital development. We say *vital development*, for in this place we are not called upon to offer any opinion as to the *origin of life*, which may ever lie darkly and far beyond the discrimination of science.

Nor are we, in associating the manifestations of life with the operation of external forces, required to discuss the nature of the so-called *vital force* as distinct from other forces, though we cannot help remarking that hitherto too broad a line of demarcation has been drawn between it and the other operating forces of the universe. Whatever the vital force may be, it never manifests itself save in connection with, or under the operation of, other forces. If it be something *per se*, it clearly can neither assert its presence nor continue its existence independent of other forces; and seeing the vast progress that has been made during the current century in our knowledge of the subtlest powers in nature—heat, light, actinism, magnetism, galvanism, and electricity—we cannot suppress the hope that science will ere long be enabled to do something more than merely give a name to the most interesting of natural phenomena.

It has also been argued—and the argument is by no means foreign to the inquiry—that if there be a process of modification in nature, by which the higher is developed from the lower, the process must embrace the mental as well as the physical organisation of the creature so developed. This argument embodies, of course, the old question of instinct and reason, or in other words, whether the guiding power of the lower animals be a thing *sui generis*, and distinct from

the reason or directing intelligence of man? It is almost needless, at this stage of science, to discuss the question. In the animal classes next to man—the birds and mammals—we perceive a growing concentration of the great nervous centres, the existence of a more convoluted brain, the possession of similar senses, acting through similar organs and influenced by similar causes. By the impressions made on these organs of sense animals are impelled to certain actions; and nothing more can be said of the causes affecting the senses of man. Colours, sounds, odours, and tastes, which are agreeable or disagreeable to man, are equally gratifying or distasteful to them; mimetic disguises in nature are alike deceptive to both; and even the very lures which men employ for their capture, prove beyond doubt that their senses and their faculties of perception and emotion are essentially the same in nature. Perception, memory, reflection, hope, fear, affection, and other mental attributes, are characteristics of the lower animals as well as of man, as may be amply studied in the conduct and docility of our domesticated species; and the only difference is that of degree, with the superaddition of other intellectual gifts (to be afterwards noticed), which are necessary concomitants of his higher development. If, then, instinct means the unreflecting impulse to certain actions, man has his instincts as well as other

animals; and if, on the other hand, reason means the power to discriminate between certain courses of action, and to choose one in preference to another, then are the lower animals, and especially many of the higher mammals, by no means without it. And here, while on the subject of mind, we may be pardoned for hinting to psychologists, that as anatomy and physiology have derived incalculable aid from the study of the structure of the lower forms of life, so may psychology obtain important assistance from a more intimate study of mental manifestations in the lower animals. If, as Edward Forbes has well remarked, the lower forms of life be "living analyses of higher organised compounds," as far as regards their somatic side, they are equally so as concerns their intellectual nature; and what often baffles on account of its complexity in man might be rendered comprehensible by a study of its simpler manifestations in the lower orders. If as zoologists we cannot possibly dissociate the physical structure of man from the great scheme of life, neither as psychologists are we entitled to attempt a severance of his intellectual nature, unless as a matter of degree, and for the mere convenience of provisional arrangement.

The main difference seems to be that the intellectual principle in the lower animals soon reaches its climax and remains stationary, while in man it is

ever improvable and progressive—improvable in the individual, and progressive in the race. And this improvability seems to arise chiefly from his power of generalising his ideas, or, as metaphysicians term it, "the faculty of abstraction," in conjunction with the power of expressing these ideas in articulate language. Indeed, on these endowments some reasoners found the main distinction between man and the lower animals; but we must not lose sight of the fact that there may be difference in *degree* without there being any difference in *kind*, and that without the higher structural adaptations—the erect gait and the hand to manipulate—these mental gifts would of themselves be of comparatively little value. "This," says Locke, in his *Essay on the Human Understanding*, "I think I may be positive in, that the power of abstracting is not at all in them; and that the having of general ideas is that which puts a perfect distinction betwixt man and brutes, and is an excellency which the faculties of brutes do by no means attain to." And Dr. H. Bischoff, in his *Essay on the Difference between Man and Brutes*, says, "It is impossible to deny to animals, qualitatively and quantitatively, as many mental faculties as we find in man. They possess consciousness. They feel, think, and judge; they possess a will which determines their actions and motions. Animals possess attachment: they are

grateful, obedient, good-natured; and again false, treacherous, disobedient, revengeful, jealous, etc. Their actions frequently evince deliberation and memory. It is in vain to derive such actions from so-called instinct, which unconsciously compels them so to act. But though we cannot deny to animals consciousness—we assert that man alone possesses self-consciousness, that is, the capacity of meditating on himself and his connection with the rest of creation." And again, a recent writer—Mr. C. Wake—in the *Anthropological Review*, vol. i., contends "that the true explanation of the inferiority of the lower animals is, that their mental powers, though not imperfect either in their constitution, development, or operation, and though containing in themselves the germ of all truth, are yet limited in their very nature, and incapable, without the assistance of a higher principle, of reaching beyond a certain range of knowledge. The soul is essentially instinctive; but superadded to instinct it possesses the power of storing up its sensational experiences, of recalling them by memory, and of reasoning from them and forming judgments as to their relations. It is observable, however, that although brute-reason enables its subjects to reason from past experience as to the proper conduct under particular circumstances, it never enables them to get further. The lower

animals have no power of abstraction or generalisation, in the proper signification of these words. They do indeed sometimes act as though they exercise such a power, but they do not in reality; the appearance of it arising from the intimate connection which always continues in the brute-mind betwixt instinct and reason. However perfect may be their reasoning about particulars, it never leads them to the knowledge of general truths, nor even to the remembrance of particular ones, except so far only as they may be influential over present action." And lastly, Max Müller, in his *Science of Language*, after admitting that brutes have five senses like ourselves, that they have sensations of pleasure and pain, that they have memory, that they are able to compare and distinguish, have a will of their own, show signs of shame and pride, and are guided by intellect as well as instinct, goes on to ask—"What then is the difference between brute and man? What is it that man can do, and of which we have no signs, no rudiments, in the whole brute-world? I answer without hesitation: the one great barrier between the brute and man is *Language*. Man speaks, and no brute has ever uttered a word. Language is our Rubicon, and no brute has ever crossed it."

To all such averments as the preceding, however plausibly or decidedly put, there is still the question:

are manifested.* This inferiority of in-
daptation, which soon reaches its climax
r animals, limits the improvability in the
and prevents progression in the race;
superior adaptation of man secures, under
conditions, at once the improvement of the
and the progress of the race. It is this
lity, taken in its widest sense, that places
ew relationships to nature—relationships
olve at once the consciousness of right and
the idea of moral responsibility. Psycho-
his is all that can be fairly advanced, and
a natural-history point of view need be
for; though we are aware that many

opinions, which have been arrived at by a long and
ly of the conduct of the lower animals, we find the fol-
corroboration in the Introduction to Agassiz' *Con-*
*the Natural History of the United States*:—"The in-
the voice of animals to one another, and all their
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for investigation in the relations between the voice
ns of animals, and a still more interesting subject of
relationship between the cycle of intonations which
es of animals of the same family are capable of utter-
far as I have yet been able to trace them, stand to
the same relations as the different, so called, families

biologists, and some of them of the highest reputation, believe in a much closer, and to some minds a more startling relationship—namely, that of an immaterial and spiritual community between man and the lower animals.

"For the most part," says Professor Agassiz,* "the relations of individuals to individuals are unquestionably of an organic nature, and as such, have to be viewed in the same light as any other structural feature; but there is much also in these connections that partakes of a psychological character, taking this expression in the widest sense of the word. When animals fight with one another—when they associate for a common purpose—when they warn one another in danger—when they come to the rescue of one another—when they display pain and joy—they manifest impulses of the same kind as are considered among the moral attributes of man. The range of their passions is even as extensive as that of the human mind, and I am at a loss to perceive a difference of kind between them, however much they may differ in degree and in the manner in which they are expressed. The gradations of the moral faculties among the higher animals and man are moreover so imperceptible, that to deny to the first a certain sense of responsibility and consciousness, would certainly

* *Essay on Classification*, pp. 96-99: London, 1859.

be an exaggeration of the differences which distinguish animals and man. There exists, besides, as much individuality, within their respective capabilities, among animals as among man, as every sportsman, every keeper of menageries, and every farmer or shepherd can testify, or any one who has had large experience with wild, tamed, or domesticated animals. This argues strongly in favour of the existence in every animal of an immaterial principle similar to that which, by its excellence and superior endowments, places man so much above animals. Yet the principle unquestionably exists, and whether it be called soul, reason, or instinct, it presents in the whole range of organised beings a series of phenomena closely linked together; and upon it are based not only the higher manifestations of the mind, but the very permanence of the specific differences which characterise every organism. Most of the arguments of philosophy in favour of the immortality of man apply equally to the permanency of this principle in other living beings. May I not add, that a future life, in which man would be deprived of that great source of enjoyment and intellectual and moral improvement which results from the contemplation of the harmonies of an organic world, would involve a lamentable loss? And may we not look to a spiritual concert of the combined worlds and all their inhabitants in presence of their

Creator, as the highest conception of paradise?" For views like these, biology, as we have elsewhere observed,* is by no means responsible. Science knows nothing of Life save through its manifestations. With the growth of physical organisation it comes, with the decay of organisation it disappears. While life endures, mind is its accompaniment; when life ceases, mental activity comes to a close. Thus far we can trace; beyond this science is utterly helpless. No observation from the external world—no analogy, however plausible—no analysis, however minute—can solve the problem of an immaterial and immortal existence. They may be received as possible or probable auxiliaries; but in the main our faith on this point must rest, as it has hitherto rested, on an altogether different foundation. What we have to deal with in the present inquiry are zoological relations which admit of probation, and we only complicate the question by the unnecessary introduction of the still more difficult problem of a spiritual community.

Our *first* proposition then is, that man in his structural relations belongs to the same zoological plan as the lower animals; and that, while in this plan there are obviously higher and lower members, adaptive modification of pre-existing structures, rather

* *Past and Present Life of the Globe*, pp. 206-7: Edinburgh, 1861.

than independent creation of new ones, seems to have been the method of nature in the production of the newer and higher forms. And further, that this principle of adaptive modification, inferred from the study of existing life-forms, receives ample confirmation from the science of extinct forms, in which the ascent from lower to higher is marked, not by the superaddition of new parts, but simply by the change or further specialisation of those pre-existing. The whole scheme of vitality, from the earliest known formations up to the present day, being clearly a development of the same typical ideas, shall we regard the newer forms as created stage after stage, in accordance with this aboriginal plan, or shall we regard their introduction as provided for and brought about, like other phenomena, by the operation of law and secondary causation? This is the whole question at issue. Need we indicate which view is most in accordance with the known operations of nature, or which recommends itself most forcibly to the acceptance of the educated intellect?

## GEOGRAPHICAL RELATIONS.

Influence of External Conditions on Life—Their Influence on Civilisation—Variation through Physical Surroundings—Power of Locality on Mental Characteristics—External Conditions merely Co-factors in the Law of Variation—Our *Second* Proposition.

On surveying the surface of the globe—whether the land or waters—we perceive that plants and animals are not universally or indiscriminately dispersed, but that certain groups are restricted to certain areas, and that the range of some groups is more extensive than that of others. In this distribution, climate, food, geological changes of sea and land, and other physical conditions, are the main factors; for as soon as any important alteration is made on these conditions, a corresponding change takes place in the distribution of the vital organisms. And not a change in the distribution merely, but often a modification of the plants and animals themselves, by which they adapt themselves to their new conditions—thriving and spreading, or declining and dying out, according to the power of adaptability with which they are en-

dowed. It is true the ranges of certain groups may suffer no perceptible change for ages, yet no truth in geology is more thoroughly established than that every portion of the earth's surface is, and has been, subjected to variations; and hence we naturally associate external conditions and vital changes, whether of distribution or of character, in the way of cause and effect. It is by no means contended that external conditions are the sole causes of vital variation, but merely affirmed that they are important and obvious causes, and, as such, must ever be taken into account in all our reasonings on the diversity and distribution of plants and animals. Like the lower animals, man is also amenable to the influences of food and climate, but being possessed of the power of clothing himself, of storing up food, and of using fire, he has acquired an almost cosmopolitan range—few tracts of the earth being untenanted by him, save the snow-clad mountain-tops or the ice-bound solitudes of the polar regions.

Though having a wider range than other animals, and less influenced by latitude and altitude, man in all his relations—physical, social, and industrial—is still intimately affected by his geographical surroundings. Under the tropics, where warmth and the means of subsistence are easily procured, he is chiefly a vegetable-feeder, improvident and little progressive; under temperate latitudes, where the means of sub-

sistence are procured with greater difficulty, and seasonal changes have to be studied, he is partly a vegetable and partly an animal feeder, more industrious, provident, and progressive; while within the polar regions, where warmth has to be sustained by diet, and where his whole time is spent in securing a precarious subsistence, he is solely an animal-feeder, toilsome but stationary. As man now subsists under these broad climatic distinctions, so he must have subsisted in former ages; and thus he may have been in turns chiefly a vegetable-feeder or chiefly an animal-feeder, according to the distributions of sea and land, and the climates thereby engendered. As the Esquimaux, in virtue of their position, are strictly animal-feeders, and have even no name for the fruits and grains, so during the Glacial Epoch in Europe a race of men may have subsisted by hunting and fishing among the glaciers on land and the icebergs on water. We mention this, in passing, to show how futile the arguments of those who contend that man was only called into being with, and could not have subsisted without, the fruit-bearing and grain-yielding plants of the present day, and thus would limit his antiquity to a chronology of their own creating. The limits of man's endurance, and the conditions under which he can subsist, are vastly wider and much more multifarious than civilised reasoners are generally prone to

believe. Indeed, so far as mere geographical conditions are concerned, he may have been an inhabitant of this earth for untold ages, and the lower the variety, the greater apparently his chances of subsistence.

Following the influence of geographical conditions, we find it affecting not only man's form and features, but determining his habits and industry, and even more intimately pervading his whole intellectual and moral nature. The inhabitants of the plains become tillers of the ground and builders of cities, while those of the mountains remain herdsmen and shepherds. The dwellers on the sea-board are naturally drawn to adventure and trading and commerce; while those of the interior as naturally abide by their homesteads and husbandry. A country of uniform soil, climate, and production, must tend in the long run to uniformity of industry as well as to a limited and stationary civilisation. No matter what the race, if the natural means of progress—vegetable, animal, and mineral—lie not within a country, its inhabitants can never rise, without extraneous aid, beyond the lowest stages of advancement. The civilisations, for example, capable of being evolved in Europe and in Australia could never have been the same, even had the aborigines of both continents been naturally equal. The fruits and grains, the horse, ox, sheep, pig, dog, and the like, which characterise the one country, and have

contributed so much to its civilisation, were totally wanting in the other, and had no analagous productions to represent them. A vegetable and animal feeding people has ever the advantage in physical strength and mental activity over a purely vegetarian race; and a country having a variety of soil, climate, and produce, is ever the most favourable for evoking an energetic and progressive civilisation. As one act leads to another act, and intellectual exercise to intellectual activity, so from their geographical positions and pursuits men are gradually led to assume national characteristics which ultimately become transmissible and permanent. Hence it is that one people continues indolent and unprogressive, while another exhibits incessant activity and progress; that one nation is lively, gay, and fickle, and another serious, sober, and steadfast. Hence also in a great measure the higher intellectual nature, and the power to subjugate and adapt the forces of nature according as geographical position supplies the means of subjugation and adaptation.

In support of this doctrine we might adduce a thousand instances, but content ourselves with one which has thus been very aptly advanced by an American observer:—"The nature and extent of the influence of topographical features receive," says Mr. Squier, in his *Notes on Central America*, "a striking

illustration both in the past and present condition of this country. At the period of its discovery it was found in the occupation of two families of men, presenting in respect to each other the strongest points of contrast. Upon the high plateaus of the interior, and upon the Pacific declivity of the continent, where the rains are comparatively light, the country open, and the climate relatively cool and salubrious, were found great and populous nations far advanced in civilisation, and maintaining a systematised religious and civil organisation. Upon the Atlantic declivity, on the other hand, among dense forests nourished by constant rains into rank vigour, on low coasts, where marshes and lagoons, sweltering under a fierce sun, generated deadly miasmatic damps, were found savage tribes of men, without fixed abodes, living upon the natural fruits of the soil and the precarious supplies of fishing and the chase, without religion, and with scarcely a semblance of social or political establishments.

"It is impossible to resist the conviction that the contrasting conditions of these two great families were principally due to the equally contrasting physical conditions of their respective countries. With the primitive dwellers on the Atlantic declivity, no considerable advance beyond the rudest habits of life was possible. He was powerless against the exu-

berant vitality of savage nature, which even the civilised man, with all his appliances, is unable to subdue, and which still retains its ancient dominion over the broad alluvions of Central and South America. His means of sustenance were too few and too precarious to admit of his making permanent establishments, which in turn would involve an adjustment of the relations of men and the organisation of society. He was therefore a hunter from necessity, nomadic in his habits, and obliged to dispute his life with men, who, like himself, were scarcely less savage than the beasts of the forest. Civilisation could never have been developed under such circumstances. It could only originate where favourable physical circumstances afford to man some relief from the pressure of immediate and ever-recurring wants. There a genial climate and an easily-cultivated soil, bountiful in indigenous fruits, would enable him not only to make his permanent abode, but to devote a portion of his time to the improvement of his superior nature."

This power of locality, physically and intellectually, has long been remarked by mankind. The language of every-day life is replete with allusions to the effects of country and climate. Hence the "bracing" influences ascribed to one district, and the "enervating" effects of another; the "healthy and exhilarating" climate of one region, and the "un-

healthy and depressing" atmosphere of another; the "steady and peaceful" pursuits induced by dwelling in the fertile plain, and the "roving and warlike" propensities engendered by living among the mountains; the "big and brawny" inhabitants of one country, and the "diminutive and feeble" of another; the "grave and thoughtful" demeanour of one nature, and the "lively recklessness" of another. Unless these influences were facts in nature, they would not have been so generally observed and acted upon; and hence it may be laid down as an axiom that man, like the lower animals, is affected in his form, his habits, his industrial pursuits, and his intellectual characteristics, by the geographical conditions of his position, and that these influences become one of the most efficient means in producing varietal distinctions or races among mankind. Indeed, we cannot conceive how these influences could operate without in time producing changes in the cerebral organisation of nations as well as in their mere muscular and bony structures. The one organ is as impressible and plastic as the other, and thus it happens that qualities, mental as well as physical, are gradually acquired, gradually become hereditary, and ultimately assume, by cumulative transmission, the magnitude of racial characteristics. "The mould," says the late lamented Edward Forbes, "in which the character of a nation

is cast, is, like most moulds, a mineral one—the soil and its properties; and the power which melts the metal, and shapes it to the mould, is the influence of temperature, whether it be a man cast by God, or a spoon cast by man. The sun and the earth, climate and soil, are the great ethnogenitors." What but the influence of new conditions that has developed the Yankee form, features, and habits from the old Anglo-Saxon stock of Western Europe? and what but the same cause that within three or four generations has begun to stamp new features on the British Australian? What but different geographical positions that evolved the Welsh, the Scotch, and the Irish Celt from the original Celtic stock of the East? and what but the same power, acting through untold ages, and concomitantly with the principle of ascensive development in time, that has stamped the still broader characteristics of Caucasian, Mongolian, and Malay? We say *concomitantly with the principle of ascensive development in time,* for it must never be forgotten that external conditions are but secondary factors, and that there is a higher law overruling the appearance of life in time than that which determines its distribution in space.

So far then as geographical conditions are concerned, man enjoys no immunity from their influence any more than other species, and if he has a wider

range and space, this he possesses in virtue of his higher intelligence, which enables him to provide clothing, shelter, food, and fire. That other species are affected in their size, form, colour, and other particulars, by the physical surroundings of their position, every zoologist will admit; and we merely contend for the operation of the same influences in the production of differences among the human family. The wider the differences in geographical positions, the broader the distinctions among the inhabiting peoples; and the more isolated any tribe, the more intensified their characteristics through want of intermingling with other tribes. Climate and food will influence form and features; the ease or difficulty of procuring sustenance will induce habits of indolence or activity; new objects requiring new names and new words to express their relations, will modify language; seasonal changes will give rise to industrial peculiarities and foresight; and thus the whole train of physical as well as of mental attributes derive their peculiarities immediately and directly from the geographical conditions by which a nation is surrounded. We do not say that physical surroundings are the sole factors in the production of varietal distinctions, but we claim for them a direct and important influence in contributing to this result among men as among other animals.

While claiming, then, for geographical conditions an important share in the modification of vitality, it must ever be borne in mind that they are merely co-factors, and could not of themselves account either for the ordinal ascent of life-forms in time, or for the correspondence between this ascent in time and the rank that prevails among existing orders. There must be other factors at work, and a higher law governing the direction of these modifications; and certain theorists only weaken the argument of external influences by seeking to ascribe to them too much in the way of varietal and specific deductions. Geographical surroundings have clearly a direct and powerful influence in the modification of life—vegetable or animal—and on man as well as on other creatures; and this, in viewing the relations of nation to nation, and race to race, is all we contend for.

Our *second* proposition, therefore, is, that as among the lower animals, so with man, geographical conditions are important factors in producing varietal distinctions, and that while adaptive modification may produce forms *for* certain ends, so may new forms be co-ordinately modified *by* the operation of external or physical surroundings. The granting of either or of both of these as sufficient causes of change, establishes a method in nature which human reason can examine

and comprehend; any appeal, on the other hand, to direct creation forecloses all inquiry, and places the matter at once beyond the range of scientific investigation.

## ETHNOLOGICAL RELATIONS.

Distribution and Varietal Distinctions—Question of Species or Varieties—Plurality or Unity of Origin?—Higher and Lower Varieties—Relations of these in time and space—Lowly Origin of the Human Race—Question of Extinct Varieties—Our *Third* Proposition.

If then, it be admitted that physical conditions—that is, situation, climate, food, and the like—in conjunction with other causes to be afterwards noticed, are instrumental in producing varietal distinctions among animals, to these we must also look for the ethnological differences that prevail among mankind. Admitting that man constitutes the only species of a single genus, there can be no doubt that his species presents several varieties and numerous sub-varieties, down even to minor and more limited distinctions. We say *varieties*, but it may be fairly questioned whether what are now called varieties would not have been regarded as distinct *species*, had zoologists had the courage to apply to man the same methods of differentiation that they are in the habit of applying to other animals. There is certainly a much wider difference between

the white man of Western Europe and the Bushman of Southern Africa, than there is between many so-called species ; but the bias of preconceptions has left its mark on zoology as on other fields of thought, and we are constrained to follow the nomenclature in vogue more for the sake of being understood than from belief in its scientific accuracy. In many instances the so-called specific distinctions in zoology are founded on colour, covering, and other features often less marked than the corresponding characteristics in man; and yet men are arranged in *varieties* merely, while these lower animals are separated into *species.* Strip these "species" of their colours and covering, and the skeleton of the one could not be distinguished from that of the other; but place the skeleton of the African Negro beside that of the European White, and a child might detect the difference. A science so partial in its methods need scarcely be appealed to for anything decisive respecting the natural-history relations of man, and the anthropologist must mainly abide by his own deductions.

Seeing, then, that the great continents of the globe contain numerous nationalities which are admittedly the results of locality or physical surroundings, and that these nationalities gradually shade into each other on their respective confines, it may be further admitted that the so-called varieties which embrace

these nationalities owe, in like manner, their distinguishing characteristics mainly to the long-continued influence of geographical conditions—the principle of ascensive variation in time being always admitted and allowed for. In Europe, for example, French, Spaniards, Italians, and other minor contiguous sections, gradually shade into each other in form, feature, language, and other peculiarities, which have evidently been superinduced by their respective positions; and hence they are regarded, though belonging to different stocks, as coming under the same variety. As the minor differences are mainly owing to geographical relations, so we may ascribe the major distinctions to a similar causation acting through indefinite periods; and thus we may trace all the varieties—European, Mongolian, Negro, etc.—as divergences from earlier varieties, and ultimately from one original source. We are aware that some naturalists, seeing the wide differences that exist between the so-called varieties, regard them as having sprung from different primordial sources, and therefore assign to them different specific centres of dispersion. But as these differences are not of equal value—that, for example, between the Caucasian and Mongol being not so great as that between the Caucasian and Negro, and that between the Mongol and Malay still less*—we think it

* The differences between these varieties being so unequal, some

unnecessary to complicate our argument with this view of equal and independent origin, and proceed to consider the major varieties as divergences from one common source, just as the minor nationalities can be shown, from their language, customs, and features, to be unmistakable offshoots from the same variety. It is no doubt quite possible that species might be independently created in the widely-separated areas in which we now find them; but the idea of their developmental descent from pre-existing forms, and in conformity to a great aboriginal plan, is much more probable, and far more intelligible. Even were the separate origin of the great varieties—Caucasian, Mongolian, Ethiopian, etc.—admitted, there is still the question, Did they originate simultaneously, or what was the order of their appearance? If not simultaneously, which was the earlier and which the later? and if earlier and later, what were the peculiar conditions that favoured the advent of the former and

writers have recently adopted the idea of two great divisions of mankind, "equal in value, and marked by characteristics of equal importance"—viz. the *whites* and the *blacks;* the former including the so-called Caucasian, Mongolian, Malay, and American; and the latter, the African, Australasian, and Papuan or Oceanic. For the ultimate purposes of anthropological science this division is not without its value, and may be further referred to in Andrew Murray's important work on the *Geographical Distribution of Mammals*, 1866.

retarded the appearance of the later? Again, if plurality of origin be admitted, we must also admit plurality of *species*, for, zoologically speaking, *varieties* are mere subordinate divergences from the same species, and could not in this sense be regarded as independent originations. In fact, this hypothesis of plurality of origin is beset with numerous difficulties, which do not attend the idea of the unity of the human species, and its subsequent divergence, in time and space, into varieties, races, and other minor distinctions. For such divergence we can perceive no cause, save what is of a physical nature; and where reason can satisfactorily trace this mode of causation operating in evident obedience to pre-ordained laws, it were outraging the principles of philosophy to appeal to direct interventions on the part of the Creator.

Ethnology, or the science of races,* as founded partly on colour and cranial and facial aspects, and partly on language and mental characteristics, is by no means in a satisfactory state; but, taking Blu-

* Ethnology or Ethnography, though the science at present most in favour, must after all be regarded as a mere department of Anthropology. The one, restricting itself to the study of existing races, can throw no light on the origin, antiquity, or destiny of man; whereas the other embraces all that can be learned of his past, present, and future—of his physiological and psychological, of his moral, social, and industrial relations.

menbach's idea of varieties (Caucasian, Mongolian, American, Malay, and Ethiopian) as the least complicated and familiar, let us try how far their relative antiquity, superiority, and probable advancement, are determinable. These white, yellow, red, brown, and black varieties, though shading into each other on their respective geological confines, are, in the main, sufficiently distinct, and present physical and mental characteristics which rank them at once as higher and lower; as fitted for development into newer and higher varieties, or as doomed to extinction. There can be no gainsaying that the Caucasian, or white man of western Asia and Europe, stands physically and intellectually on a higher platform than the Mongol or yellow man of eastern and northern Asia. Within the last four thousand years the former has notably advanced in art, science, and literature—in all, in fact, which constitutes civilisation; while, during the same period, the latter has remained almost stationary, or but little progressive. Again, however much mistaken philanthropy may argue to the contrary, there can be as little doubt that the Ethiopian, or black man of Africa, is inferior both to Mongol and Malay, and still more so to the Caucasian.* He

* Even *physically* the white man is his superior, and has greater power of endurance, according to the Livingstones, even under the burning sun of his own natural habitat. "Our experi-

has had possession of the African continent, with all its variety of situation, climate, and produce, from time immemorial, and yet he has no arts save the rudest, no literature, no science, no cities nor temples, no ships, no moral code; in most instances no idea even of a Supreme Being—nothing, in fine, that removes him much beyond the desires and necessities of animal existence. Speaking of Commoro, one of the most active and intelligent of the chiefs whom he met on the Upper Nile, Sir Samuel Baker says:—"In this naked savage there was not even a superstition upon which to found a religious feeling; there was a belief in matter; and to his understanding everything was material."* As with the African, so according to Dr. Mouat, with the Andamaner, and so also, according to Dr. Lang, with the natives of Australia; "they have no idea of a Supreme Divinity, no objects of worship, no idols nor temples, no sacrifices, nothing whatever in the shape of religion to distinguish them from the beasts."†

Notwithstanding all this, and a thousand times more which could be adduced from every region, there

ence tends to prove," say they, "that the European constitution has a power of endurance, even in the tropics, greater than that of the hardiest of the meat-eating Africans."—*Narrative of an Expedition to the Zambesi*, p. 179.

* *Great Basin of the Nile*, vol. i. p. 250.

† Lang's *Aborigines of Australia*.

are some who will still argue about the equality of the human race, and talk high-sounding generalisations regarding the unity and the brotherhood of man. As well might they contend for equality among brothers of the same family, or for equal capacity among the men and families of a nation. Nature, as has been well remarked, is a hierarchy, not a democracy; and as in the physical world there are suns, and systems, and satellites, so in the vital and intellectual there are higher and lower—races born to command and lead, and others as certainly destined to obey and to follow. It is not because one race has risen under favourable conditions, and another retrograded or remained stationary under conditions of an adverse nature, but because of aboriginal differences and capabilities which no circumstances can efface nor appliances counteract. And these differences, when interpreted in the light of progression, have clearly reference to time—to periods during which the higher succeeded the lower, and the lower that which stands next beneath it. Brotherhood there may and ought to be, as far as the inherent instincts of race towards race will permit, and these instincts are not to be disregarded with impunity; but as to unity—if by unity is meant oneness of power and tendency, it is an assertion which all history contradicts and present experience must deny. It is a mere phrase that may

please the unthinking ear, but it is not a fact that can satisfy the reason.

This relative superiority and inferiority of the varieties of mankind is so obvious, that it need not be further dwelt upon, unless to show that as the White man advances and spreads over the continents of the world, one of two things must follow—viz. either the coloured and inferior races will be absorbed into his race and partake of his improvement, or in time be utterly extinguished. Looking at the whole history of mankind, so far as history throws any light on the matter, this has been the unfailing course of events—the superior races advancing, and absorbing the inferior races where in any way closely related, and extirpating them where the difference was so great as to prevent interfusions and amalgamations. And even at the present day and under our own eyes, we have the most ample confirmation of this invariable method of nature in the fact that in the same continent and among the same race the higher nationalities are gradually absorbing the lower, and that the White man is gradually extirpating the American Indian, the Tasmanian, Australian, and all inferior varieties, wherever he plants himself, and carries along with him the adjuncts of his superior civilisation. Speaking of the relative positions of the races—white, black, red, and yellow—in North America, a recent writer

describes the superiority of the White in these truly graphic and comprehensive terms:—"The White Man, caring for neither frost nor fire, so long as he can win good food for his mouth, fit clothing for his limbs, appears to be master in every zone; able to endure all climates, to undertake all labours, to overcome all trials; casting nets into the Bay of Fundy, cradling gold in the Sacramento valleys, raising dates and lemons in Florida, trapping beavers in Oregon, raising herds of kine in Texas, spinning thread in Massachusetts, clearing wood in Kansas, smelting iron in Pennsylvania, talking buncombe in Columbia, writing leaders in New York. He is the man of plastic genius, of enduring character; equally at home among the palm-trees and the pines; in every latitude the guide, the employer, and the king of all."*

Reasoning from what we know of the existing varieties of mankind and the tribes and nationalities embraced by these varieties, it may be logically inferred that the Caucasian or White man has been preceded by the Mongol, Red Indian, and Malay, and that these in turn were preceded by the Ethiopian or Negro. As the White men of the American States are the immediate descendants of the nations of Western Europe, and as these nations were descended in turn from more Oriental stocks, so clearly must the

* Dixon's *New America*, 1867, vol. i. p. 14.

great varieties have been descended from each other —the later from the earlier, the higher from the lower, and the lower from those next beneath them. In fact, the great varieties of mankind belong rather to geological periods than to geographical regions, for though we assign to them different habitats on our maps, it is clear that physical causes alone could not account for their differences, physiological and psychological, and we are compelled to call in that principle of ascent in time which antedates the lower and places the higher at stages later and later according to their superiority. It is true we have no historical evidence of these descents, for they took place long before and beyond the reach of all history and tradition, and it is also true that geological changes must have obscured more or less their traces by the sinking of old lands and the elevation of new ones; still, if there be such a thing as creational progression, there must have been an ascent from lower to higher, and we are not entitled to regard the lowest now known as the original stock of the human species. In fact, the idea of progression involves the belief in an ascent from lower to higher, and shuts out all argument to the contrary. We are nevertheless aware that some, founding on certain doctrinal tenets, deny the lowly origin of the human race, and contend for a purer and higher, from which man has retrograded and declined. In

dealing with matters of science, however, we must abide by scientific methods, and all that can be naturally drawn from tradition, from history, from archæological relics and from geological remains, as to the earliest conditions of mankind, points unmistakably to rude and primitive beginnings. It is impossible, indeed, that it could be otherwise, for man's moral sentiments—that is, his whole notions of right and wrong—spring out of his relations to other men, and grow as a necessity with the growth of society; and we cannot conceive of their presence without such relationships to call them into existence and exercise. Whatever his origin, man's first condition, as well as that of his immediate descendants, must have been of a lowly and primitive nature, with everything to acquire, and no accumulated experience to assist. Even the source from which those who hold a contrary opinion profess to derive their beliefs, refers in the plainest language to men covering themselves with leaves and skins, subsisting on fruits and flocks, sheltering themselves in caves and tents, prone to disobedience, guilty of fratricide, and in no ways differing in condition, physically or mentally, from the rudest races of the present day. If we admit progression, we must of necessity consent to the lower state from which the progress has been effected.*

* These opinions find ample corroboration in a paper read by

Of any varieties lower in point of organisation than the lowest of the present day, we have no unquestioned geological evidence. The few cranial fragments found in Western Europe (we refer to the Neanderthal and other skulls) seem abnormal rather than typical; and even were they more numerous, and all of a type, they could not carry us back beyond times immediately post-glacial, nor could they prove aught of the regions from which Europe evidently derived, by way of descent, its flora and fauna.

Sir John Lubbock at the Dundee meeting of the British Association, in which, after an elaborate review of the whole argument, the author arrives at the following conclusions:—1. That existing savages are not the descendants of civilised ancestors. 2. That the primitive condition of man was one of utter barbarism; and 3. That from this condition several races have independently raised themselves. "These views," he goes on to say, "follow, I think, from strictly scientific considerations. We shall not, however, be the less inclined to adopt them on account of the cheering prospects which they hold out for the future. If the past history of man has been one of deterioration, we have but a groundless hope of future improvement; but, on the other hand, if the past has been one of progress, we may fairly hope that the future will be so too; that the blessings of civilisation will not only be extended to other countries and other nations, but that even in our own land they will be rendered more general and more equable, so that we shall not see before us always, as now, multitudes of our own fellow-countrymen living the life of savages in our very midst, neither possessing the rough advantages and real, though coarse, pleasures of savage life, nor yet availing themselves of the far higher and more noble opportunities which lie within the reach of civilised man.

If men lower than the Bushmen, the Andamanese, the Hill-tribes of India, or the Australian, existed in bygone epochs, to Asia and Africa geology must look for evidence of the fact; and not till these regions have been fully explored, can we do more than merely admit the existence of extinct varieties as a logical inference from what we already know of the creational law of continuity and progress. And if we accept the inference of their existence, we must believe in their necessarily lower organisation and inferior intellectual attainments.

If, then (and this brings us to our *third* proposition), there has been an ascent of tribes and nationalities from earlier and lower nationalities (and of this there can be no doubt); and if the superior and advancing gradually absorbs or annihilates the inferior and stationary (and of this there can be as little doubt); it is clear that the lower varieties must be the more ancient, and the higher the more recent. In this way we arrive at the conclusion that the Indo-European or white man is the most recent variety, and that the coloured varieties are, stage by stage, according to their inferiority, of greater antiquity. In this way also we may conclude that as the higher varieties are ascensive developments from the lower, so in all likelihood there has been an ascent

from lower and earlier varieties that have long since become extinct. What the form and features, what the intellectual capacity and capabilities of such extinct races, we have no knowledge, and may never have ; but clearly all analogy favours the inference that the difference between them and the lowest form of Negro may have been as great or even greater than that which exists, physically and intellectually, between the highest European and the lowest Ethiopian. Of these extinct varieties ethnology gives no information ; and for all that preceded the existing order of things we must appeal, as will be done in a subsequent section, to geology, and the appointed order of creational development as revealed by palæontology.

## FUNCTIONAL RELATIONS.

Physical and Mental Functions in common with other Animals —Man Improvable and Progressive—Influence and Results of this Progression—Man a Modifier of Nature—Spread and Ascension of the Higher, and Decline and Extinction of the Lower Varieties—Our *Fourth* Proposition.

In virtue of his animal nature, geographical position, and racial differences, man, like other creatures, has certain functions or duties which he is necessitated to perform. Like other animals, he must procure food and shelter, and this duty will be less or more arduous according to his situation on the earth's surface. He must also protect himself from the attacks of other animals, and especially from those of his own kind; and this he will be enabled to do in proportion to his superior strength and skill and the nature of the position he occupies. But while in virtue of his animal nature he must perform these functions in common with other creatures, there are other duties arising from his superior organisation and intellectual endowments which are peculiar to himself, and which he alone is destined to perform.

Walking erect, capable of turning readily to all sides, possessed of those wonderful instruments the arm and hand, and gifted with a mind to direct their operations, in functional performance he immeasurably excels all other animals. As a tool and implement-maker he acquires new power over the opposing forces of nature; and as a fire-kindler and machine-inventor he increases that power ten-thousand-fold. But man is not merely a fabricator of mechanical tools, he is also an inventor of intellectual tools—of political, social, moral, and religious schemes, by which he at once promotes his own comfort and secures the improvement of his successors. Endowed with the gift of language, and capable of recording his experiences, generation after generation he advances in knowledge, and thus, unlike other animals, he is improvable and progressive—improvable in the individual and progressive in the race. The most highly endowed and docile of the lower animals remain now as they ever were ; the lowest of the human race is always capable of some improvement. The range of the former is fixed and limited, that of the latter seems illimitable. It is this improvable intellect in man that enables him to subjugate and adapt the forces of nature—winds, currents, heat, light, electricity, and the like ; and just in proportion to this subjugation and adaptation does mankind ascend in the scale of

civilisation. Where man cannot subdue the forces of nature, they dominate over him; and just in proportion to this victory, so will ever be his material and intellectual advancement.

Already man has investigated and turned to his aid many of the forces of nature, reduced the metallic ores, and constructed machinery of marvellous capabilities; and as he advances we may fairly believe there is no natural force, however subtle or however powerful, that is not destined to come under his mastery and adaptation. It is this power of adaptation that marks in an especial manner the progressive from the declining races of mankind; and we may safely hold it as a matter of faith, that according to the possession of this power are certain races destined to advance, and others as certainly doomed to extinction. In virtue of his civilisation man extirpates, disseminates, and cultivates plant-life; extirpates, disseminates, and domesticates animal-life; and extirpates or civilises his fellow-men. In his spread over the earth, and as population increases, man must necessarily raise an increased supply of food by artificial means, and thus he cultivates some plants and extirpates others. He also transfers the plants of one region to another, and thus becomes the instrument of new distributions and arrangements. The lower animals may occasionally do the same, and on

a limited scale, but this unintentionally; whereas with man it is the work of design, and ever increasing with his requirements. In like manner he extirpates, disseminates, and domesticates animals, destroying those that are noxious and hostile, carrying from one region to another those that are useful (and occasionally by accident some that are injurious), and domesticating and increasing in a wonderful manner those on whom he relies for his food, clothing, and assistance in his daily labours. Indeed, wherever man settles down he becomes a modifier of nature, and as one portion of nature is intimately associated with every other portion, so every modification ramifies and extends far beyond the circle of direct interference. The felling of forests and the drainage of land, for example, affect climate, and with the slightest change in climate arises a whole round of alteration in plants, and consequently also in the animals that subsist upon them. The extirpation of certain plants may lead to the destruction or removal of certain animals, and with the destruction of these animals others may so increase as to effect the destruction of a second set of plants, thus involving the extinction or removal of a third set of animals, and so on through interminable ramifications. In this way man has materially interfered with the distribution of plants and animals, and this more especially since the white man of Europe

became a settler in the Americas, in South Africa, Australia, and New Zealand.

And just as man, in his progress to civilisation and refinement, interferes with the natural distribution of plant-life and animal life, so in a similar manner he interferes with the distribution of his own race, civilising and amalgamating with those who are nearly related, and extirpating those who are widely different and incapable of civilisation. Wherever there is incapacity for civilisation, irresistible as doom itself the advancing variety will pass over and absorb the stationary; and the higher the civilisation of the aggressive race the more rapid and thorough the extermination of the inferior and declining. In this way and under the rapid advancement of the white man melt away the Red Indian from America, the Bushman and Hottentot from South Africa, and the Aborigines from Tasmania and Australia. Such appears to be, and such seems to have ever been, the course and order of nature. The higher and advancing has ever passed over the inferior and stationary; the older and effete must ever make way for the recent and vigorous. The whole history of mankind is but a record of aggression and subjugation, of progress and extinction. Wave after wave has passed over the historic platform of Asia and Europe, the latest ever obliterating that which went before,

and ever assuming fairer and nobler proportions. And as with nationalities, so with varieties in a broader sense; the recent and superior will ever spread, the earlier and inferior must coincidently dwindle away before them. Bound by the obligations of enlightened humanity, the white man may and must endeavour to civilise and ameliorate the condition of his less enlightened and coloured brethren; but no humanising scheme, however anxious or earnest, can ever arrest that law which has destined the progression of the human race—the extinction of the inferior, and the rise and spread of the higher varieties. Humanly speaking, it is only in this way that the progressive advancement of mankind can ever be attained; rationally, it is the only method the human mind can comprehend and appreciate.

It is in vain to talk, as some well-meaning but sadly-misinformed men often do, of the civilising and ameliorating influences of admixture and amalgamation. There can be no permanent amalgamation of races that are widely different, no admixture of superior and inferior types, which does not lead in the long run either to the extinction of the inferior or to the debasement of the superior. The whole testimony of history—whatever it is worth—is against this presumption, and our knowledge of all recent attempts directly refutes it. "It may be claimed without

hesitation," says a Transatlantic writer,* who has had ample opportunities of studying the results of admixture in the New World, "that the wide physical, intellectual, and moral differences which all history and observation have distinguished as existing between the various families of man, can be no longer regarded as the consequences of accident or of circumstances; that is to say, it has come to be understood that their physical, moral, and intellectual traits are radical and permanent, and that there can be no admixture of widely-separated families, or of superior with inferior races, which can be harmonious, or otherwise than disastrous in its consequences. Anthropological science has determined the existence of two laws of vital importance in their application to man and nations. *First*, That in all cases where a free amalgamation takes place between two different stocks, unrestrained by what is sometimes called prejudice, but which is in fact a natural instinct, the result is the final and absolute absorption of one in the other. This absorption is more rapid as the races or families thus brought in contact approximate in type, and in proportion as one or the other preponderates in numbers; that is to say, Nature perpetuates no human hybrids, as for instance a permanent race of mulattoes. *Second*, That all violations of the

* *Notes on Central America.* By E. G. Squier. Boston, 1855.

natural distinctions of race, or if those instincts which were designed to perpetuate the superior races in their purity, invariably entail the most deplorable results, affecting the bodies, intellects, and moral perceptions of the nations who are thus blind to the wise designs of Nature and unmindful of her laws. In other words, the offspring of such combinations or amalgamations are not only generally deficient in physical constitution, in intellect, and in moral restraint, but to a degree which often contrasts unfavourably with any of the original stocks.

"In no respect are these deficiences more obvious than in matters affecting government. We need only point to the anarchical states of Spanish America to verify the truth of the propositions here laid down. In Central and South America, and in Mexico, we find a people not only demoralised from the unrestrained association of different races, but also the superior stocks becoming gradually absorbed in the lower, and their institutions disappearing under the relative barbarism of which the latter are the exponents. It is impossible, while conceding all the influence which can be rationally claimed for other causes, to resist the conviction that the disasters which have befallen these countries are due to a grand practical misconception of the just relations of the races which compose them. The Indian does not possess, still

less the South Sea Islander, and least of all the Negro, the capacity to comprehend the principles which enter into the higher order of civil and political organisations; his instincts and his habits are inconsistent with their development, and no degree of education can teach him to understand and practise them." . . . . . "To the understanding of intelligent and reflecting men, who are superior to the partisan and sectional issues of the hour," he continues, "these considerations cannot fail to appeal with controlling force; for if the United States, as compared with the Spanish American republics, has achieved an immeasurable advance in all the elements of greatness, that result is eminently due to the rigid and inexorable refusal of the dominant Teutonic stock to debase its blood, impair its intellect, lower its moral standard, or peril its institutions, by intermixture with the inferior and subordinate races of man. In obedience to the ordinances of Heaven, it has rescued half a continent from savage beasts and still more savage men, whose period of existence has terminated, and who must give place to higher organisations and a superior life. Short-sighted philanthropy may lament, and sympathy drop a tear as it looks forward to the total disappearance of the lower forms of humanity, but the laws of Nature are irreversible—it is the will of God!"

By these means and by these laws—and so far as science can perceive none other have ever operated or now operate—the earth, instead of remaining the abode of rude and savage tribes, becomes more and more the home of intelligent and civilised men, capable of appreciating its bounties and comprehending the power, wisdom, and goodness by which it has been instituted and sustained. The higher the ascent of the human race, the more clearly will they perceive their relations to external nature, to God, and to their fellow-men ; and thus the gradual extinction of the inferior varieties and the spread of the higher become, under the operation of a great natural law, one of the means by which the Creator is glorified in his works, and man more and more blessed through their development. As the ascensive varieties of mankind perceive more clearly their relations to external nature—and it is only in the higher varieties that this perception manifests itself—the more will they conform their conduct to the methods of nature, thereby not only augmenting their own happiness, but accelerating the ascensive progress of their successors. The more fully that man understands his relations to the God of nature—and the most bigoted opponent of these views must admit that it is only among the higher races that anything like rational notions are entertained of a Creator—the purer will

be his religion and the deeper his devotion. The more also that man understands his relations to his fellow-men, the higher his conceptions and the more active his discharge of these moral obligations which constitute the bond and union of all human brotherhood. It may be that sin and suffering, vice and misery, cold-hearted indifference and absolute cruelty, are to be found among civilised as well as among savage nations; but no unbiassed reasoner can gainsay that personal liberty, right to property, respect to life, domestic affection, truth, honour, and all the other social virtues, find a wider recognition and practice among the white than among the coloured and inferior varieties of our race. If it were not so, civilisation would be a delusion, and intellectual cultivation not more to be coveted than savage ignorance and brutal superstition.

Nor let it be forgotten that the functional obligations of the man can never be superseded or compounded for by those of the race; and that no abstract notions respecting the upward progress of the species can interfere with the bounden efforts of the individual. As no one can discharge for another the physical functions of his animal nature, so no general arrangement can ever relieve the individual of the responsibility that attaches to the fulfilment of his own social and moral duties. As the character of a society de-

pends upon the character of those composing it, so the advancement of a race must depend upon the progressive efforts of its component members; and under this view the functional relations of every man—that is, his relations to external nature, to his God, and to his neighbour—take a higher aim and assume a wider significance. It is something for the individual mind to be conscious of its own attainments; it is something more to have the feeling that it is contributing—not negatively by refrainment from evil, but positively by the performance of good—to the general advancement of the species.

And this, be it remembered, is always best accomplished by every one manifesting to the utmost of his power the gifts of his own individual nature. Physically and mentally, we have much—indeed the most of what we possess—in common with our fellow-men; but beyond this every one has his own individuality—something that distinguishes him from other men, and which, as a special endowment, was clearly designed to subserve some important purpose; and it is for the maintenance and manifestation of this individuality in our functional relations that philosophy contends. For, as in the material world all growth and movement take place through the action and reaction of dissimilars; so in the moral and intellectual there can be no advancement save through the

interactions of individual opinion. It is well, therefore, to bear in mind that this individuality—whether in nations or in individuals—is a thing that may be directed, but cannot with impunity be suppressed; a thing that, as it has existence in nature, so it must have exercise in the performance of those functions which nature has rendered imperative.

There can be no greater delusion, therefore, as regards man's functional relations, than the expectation that either individuals or nations will ever be brought to the same beliefs, or to one common course of action. So long as there are aboriginal differences or individualities, so long will men and nations continue to differ in thought and practice, and through these differences continue to elicit the true and progressive. No doubt, the higher man's knowledge, and the nearer his approach to truth, the less will these differences become; but to endeavour to suppress them in conformity with any conventional notions were a bar to all activity and improvement. It may at first sight seem an evil that there should continue to be differences and contentions, but the contentions arise from a misconception of the purport of this individuality; and not till men have learned to look upon it as a thing to be respected—a gift to be directed and not to be suppressed—will it have its full efficiency in the promotion of human progress.

Individually, it is the only thing we can really call our own; as we value it for ourselves, let us also respect it in others, whether as in man to man, or as in nationality to nationality.

Looking, therefore, at man in his functional relations, our *fourth* proposition is, that like other animals he has certain duties to perform purely of a physical nature, and which are rendered imperative by the requirements of existence. In virtue, however, of his higher organisation and intellect, he can, within certain limits, subjugate and adapt the forces of nature, and thus acquire a mastery over obstacles which no other animal can, and this mastery will be in direct proportion to his intelligence and cultivation. And further, that while other animals but slowly and within restricted limits affect the distribution of plants and other animals, man becomes a modifier and subcreator as it were—here extirpating and transferring, there cultivating and disseminating; and even as regards his own species, civilising and exterminating, according to the natural capacity or inaptitude of the inferior races for civilisation and advancement. We say *civilising and extirpating*, for there can be no domestication of man as there is domestication of the lower animals. To domesticate is to enslave, and nature has never yet permitted the institution of permanent

enslavement, as it has provided for and fostered that of permanent domestication. And finally, that these functional relations are in accordance with a great law of natural progression, by which the development of newer and higher races shall ever be coincident with the extinction of the earlier and inferior.

Such are the relations—zoological, geographical, ethnological, and functional—which constitute man's WHERE, or the place he now occupies in the scheme of creation, and from which the following inferences may fairly be deduced :—1. That adaptive modification of pre-existing structures, rather than independent creation of new ones, seems to be the method of nature in the production of newer and higher life-forms, and that in this respect man comes under the same category as the rest of his fellow-creatures. 2. That man, like other animals, is influenced by external conditions; and that while, in accordance with a great creational plan, adaptive modification is producing newer and higher forms, geographical surroundings are co-ordinately instrumental in favouring the same results. 3. That in obedience to a great progressional law, and under the influence of geographical conditions, man passes into newer and higher varieties—the lower varieties being thus necessarily the earlier and the higher, and ascensive the

# WHENCE?

more recent; and 4. That, gifted with improvable and progressive functions, man subjugates and adapts the forces of nature, rising higher and higher in the aggregate or as a species—the inferior varieties disappearing before the spread of the higher and more civilised. Admitting these inferences, and the facts from which they are drawn, we will be better prepared to understand man's history and origin—that is his WHENCE—as well as to follow more clearly his WHITHER, or the progressive destiny that lies before him. The whole forms one great successional category of events, in which the past merges into the present, and the present into the future, and which we can only understand in proportion to our knowledge of the existing relations and operations of the universe.

# WHENCE?

## HISTORICAL RELATIONS.

Tradition Uncertain and Unreliable—All History Recent and Partial—Discrepancies in Chronological Systems—Inferences as to Man's Antiquity from the Known Rate of Progress in Civilisation and Refinement—Our *Fifth* Proposition.

ADMITTING man's existing relations, or the position he now occupies in nature, let us next try to discover what light can be thrown on the antiquity of his species relatively to the antiquity of other species. For this purpose we must appeal to History in the first place, and where History fails us we must turn to the record preserved in the earth's rock-formations, and which Geology is striving to interpret. Having obtained some notion of his antiquity, or, in other words, having traced him nearer and nearer to his origin, we may discover some indication of the nature of that origin, and the process by which it was effected. In the prosecution of this inquiry, science has to contend not only with numerous difficulties but with inveterate prejudices—difficulties inasmuch as both historical and geological records are obscure and im-

perfect, and prejudices arising from early and widely-accepted beliefs. Notwithstanding these difficulties and prejudices, an attempt must be made; and though science in the meantime may fail in arriving at satisfactory conclusions, she may succeed in indicating the way to more rational convictions both as to the time man has been struggling upwards on this globe, and the nature of the source from which he started. And this, be it observed, is always something gained—the unsettling of former prejudices being next to the establishment of new convictions.

In appealing to history for any information respecting the antiquity and origin of man, it will be readily admitted that the response must necessarily be faint and unintelligible. All tradition on the subject is vague and unreliable; all written history is recent, partial, and uncertain. And even where no uncertainty need be, historical facts are so frequently obscured by traditional beliefs that it is often impossible to separate the real from the unreliable. "In the history of ancient nations," as has been truly remarked by Sir J. Gardner Wilkinson, "the early portion usually consists of mere fable, either from real events having been clothed in an allegorical garb, or from the substitution of purely fanciful tales for facts in consequence of the deficiency of real data; to this succeeds an era when, as manners and habits

become settled, amidst fable and allegory, some descriptions of actual events are introduced; and, at length, history, assuming the exalted character that becomes it, is contented with the simple narration of fact, and fable is totally discarded. But such is the disposition in the human mind to believe the miraculous, that, even at a period when no one would dare to introduce a tale of wonder unsupported by experience, credit still continues to be attached to the traditions of early history, as though the sanction of antiquity were sufficient to entitle impossibilities to implicit belief."* Where fable, fact, and allegory get so commingled, it will be readily seen how little, either direct or suggestive, can be drawn from the historical element of our inquiry. "It is easier, indeed," as remarked by Bacon, "to extract truth from error than from confusion."

It would be waste of time, in the present state of our knowledge, to appeal to the chronologies of the Chinese and Hindoos, for even could they be brought within the category of critically-substantiated history, and did carry us back some hundreds of thousands of years, they give no indication of the stages through which man has passed, nor other than the most absurd and fabulous accounts of his origin. There may

* *Manners and Customs of the Ancient Egyptians*, vol. i. Second series.

be some germs of truth in their dynasties and epochs, but clearly they can form no foundation for rational convictions respecting man's antiquity, and merely impress us with a vague idea of the vast time that Eastern Asia has been peopled by civilised races. We say *the vast time that Eastern Asia has been peopled*, for if observers like the missionary fathers have been constrained to admit a veritable antiquity to Chinese records of five or six thousand years, what shall be said to the ages that must have preceded these muniments, and during which the race was gradually working its way upward from nomadic barbarism to a position of settled industry, and to the establishment of complicated social and ethical systems? Nor can much more be said in favour of the astronomical record of the Chaldees. Carrying us backward in time some three or four hundred thousand years, it seems incapable of verification by modern astronomers, and we can only receive it as a vague corroboration of the high antiquity of the human race in the region to which it refers. Even were it reliable, it gives no indication of the successional stages of man's advancement, nor does it lead, any more than the chronologies of the Chinese and Hindoos, to the faintest conception of a rational beginning for our race. And yet we cannot help remarking that these time-records, wide and uncertain as they are, seem more in accordance with the vasti-

tude of time implied by the geological relations of human remains than other chronologies more frequently appealed to.

Nor is the case much altered when the research is carried into Western Asia and Egypt. Egyptian allusions, so far as they have been interpreted, would carry us much beyond the ordinarily-received chronology of six thousand years, but they do not point to any intelligible beginning, nor trace any line of descent, beyond a few dynastic successions, even for their own nationality. Whether we accept the estimate of the French *savans*, who ascribe to the oldest Egyptian monuments an antiquity of from eight to ten thousand years, or that of Chevalier Bunsen, who doubles the amount, we are not in the least degree assisted to any definite notion respecting the chronology of the race who reared these monuments, and who must have existed for centuries before they had acquired the power to construct such gigantic and enduring memorials. Great darkness, in like manner, hangs over the contemporaneous nationalities of Western Asia, whether Assyrians, Phœnicians, or Hebrews; and though the latter have left a circumstantially-narrated account which has deeply influenced the beliefs of modern Europe, that account is of itself so much a matter of interpretation and calculation, that the widest discrepancies exist between the esti-

mates of biblical scholars equally earnest, pious, and learned. Whether we turn to the Romish fathers, or to such men as Usher, Hales, Newton, Blair, and Dufresnoy, we find estimates varying from four thousand to seven thousand years; and when the appeal is made to some German divines the range is extended to nearly double that amount! * A record admitting of such wide interpretations by scholars equally learned and earnest, is clearly one upon which science cannot base her conclusions, and all the less that it is a list of family genealogies rather than an account of ethnological successions. And even were there no discrepancies in interpretation, and no doubt as to the order of Hebrew descent, it is evident that no record can carry us back to the beginnings of mankind—to those far-back stages of primeval life during which language itself can do little more than express the necessities of animal existence.

So far then as the historical element is concerned, it throws no certain light on man's antiquity; and when it is considered how uncertain and debateable are many events in the last two thousand years of

* A French writer, Desvignoles (*Chronology of Sacred History*), has collected above two hundred different calculations, varying from 3483, the shortest, to 6984, the longest period said to have elapsed between the creation of the world and the commencement of the Christian era, but recently the discrepancies have become wider and much more preplexing!

European history, the want of reliable data as to man's first appearance ceases to be matter of surprise. Man must have struggled onward and upward for ages before he became a recorder of his own history, and when he became so all the early stages of his ascent must have been irretrievably lost, even to tradition itself, with all its fertility of fancies and actions. Such, indeed, seems to be the unavoidable course of human progress:—its earliest stages utterly lost in the forgetfulness of barbarism, the middle stages distorted and clouded by myths and fables, and only the latest assuming the orderly sequence and reliability of history. It is with the existence of man as it is with the life of the individual. We may commit to record from early youth, and carry our recollections back to the days of childhood, but there lies beyond these the blank of infancy, which bears with it no remembrance of its acts and no consciousness of its existence. It is in vain, therefore, to look for any chronology before man learned to record; hopeless to expect anything like certainty from the tales and undated memories of tradition.

As far, therefore, as history is concerned, we appeal in vain for any intelligible response as to the antiquity of the human race. We can trace back a few of its latest and leading stages, as from Saxon to Celt, from Celt to Roman, from Roman to Greek,

from Greek to Phœnician and Hebrew, and from Hebrew to Egyptian, Chaldæan, and other Orientals; but these are only a few of its most recent and civilised stages. Of all the races that went before, working their way onward and upward to the civilisation of which these nationalities were the successive exponents, we have scarcely the trace of a tradition, and are left in utter ignorance alike of their chronological sequence and the localities they possessed. All, then, that can be fairly and honestly affirmed as to man's historical relations is this:—That the evolution of new races and nationalities is a thing of slow and gradual growth, and as many nations have undoubtedly risen and disappeared on the historic and traditional platforms of Asia and Europe, the antiquity of man, even in these areas, must be far, unspeakably far, beyond the popular chronology of six or seven thousand years; and further, that as civilisation is a thing of slow and gradual evolution, and as many Asiatic and European peoples have successively risen to high degrees of civilisation and refinement, so the legitimate inference from this source is also that of a higher antiquity for mankind in Asia, Northern Africa, and Europe. Indeed, whether we appeal to written history or to monumental evidence, we find all over Southern Asia and Southern Europe different phases of civilisation,

different languages, different styles of architecture, and different forms of religious worship, all of which must have taken thousands of years for their elaboration, even at the ratio of existing progress, and infinitely more in times when the arts and sciences, mechanical appliances, and means of intercommunication were in their infancy as compared with those of the present day. This slow evolution of new peoples with new civilisations, new languages, new religions, new customs, and new architectural ideas, is seldom sufficiently thought over. Were it otherwise, no other argument would be necessary to expose the absurdity of a chronology that would limit the existence of man to the lapse of a few thousand years.

Let the question be fairly and reasonably looked at, as between men anxious and earnest to arrive at the truth, and not bound to defend any bias or preconception! No matter in what state, intellectually and morally, man originated (a matter which will be considered under another section), it is clear that in time past, as at present, his beginnings in every region have been of a lowly and primitive kind. From this primitive condition newer and advancing nationalities have had to be evolved; and as this has ever been (we appeal to all history) a gradual and fluctuating process, it must have required long time for its accomplishment. Language has also had to be ela-

borated—new names for new objects, and new phrases to express their relations; and this also requires time, to say nothing of the growth of new languages for the advancing races, or of the ages required for the invention of letters and the passage of oral into written and methodical forms.* Man, for his subsistence and comfort, has also (at least in temperate regions) to cultivate certain plants and domesticate certain animals, and as these plants and animals are naturally restricted to limited districts, they have had to be carried from region to region and acclimatised, to pass into new varieties and breeds—into the varieties and breeds which we now enjoy; and all this must have taken long ages for its accomplishment. As a fabricator of mechanical tools, man has also had to pass from wood, bone, and stone, which lay conspicuously around him and ready for use, to the metals; and as these for the most part occur in earthy ores, it must have been long before he learned to

* We lay no stress on the argument against linguistic progression which some philologists attempt to derive from the grammatical structure of all language. Mind is essentially methodical, and cannot convey its ideas to another mind—however few and simple these ideas may be—without following the order in which they occur to itself. In this way language assumes a connected and methodical form long before grammarians attempt to analyse it. It is language that involves grammar, not grammar that makes language.

extract them and fashion them into implements and machinery. But he is also an inventor of intellectual tools—of social, political, and religious schemes, by which he secures his safety and progress; and as these schemes have presented themselves in innumerable forms on the platforms of civilised Asia, Europe, and Northern Africa, and as men are especially tenacious of customs and observances, and slow to accept newer forms, the time required for the elaboration of these must have been very long, historically speaking, and prehistorically even of longer duration. In fine, view it as we may, no history gives any satisfactory idea of man's antiquity; and whatever rate of progress we assume, the time he has been working his way onwards and upwards through the various races and nationalities of Asia, Northern Africa, and Europe, must vastly exceed the limits of any attempted chronology.

"We may venture to assert" (says Baron Bunsen,* arguing from a different stand-point, but having the same chronological object in view), "without being charged with temerity by competent authorities, that in consequence of Egyptian researches, the arbitrary barriers which Jewish superstition and Christian sloth have erected upon God's free field of human history are for ever broken down. The ordinary views as to

* *Egypt's Place in Universal History*, vol. iv. p. 20.

the existence of our race and the antiquity of its records are as childish as were the ideas and assumptions current fifty years ago about the age of this planet. Partly owing to theological prejudices, and partly to the want of a thorough philosophy of history, the views of the relations and bearings of general history have been hitherto as inaccurate as the results would be if an anatomist should attempt to restore the whole organisation of an extinct ichthyosaurus from the dorsal bones of our lower lizards, and to make a foreshortened drawing in perspective of such a fanciful object before and behind. Would it be matter of surprise if such a drawing should finish in mythical or mystical arabesques, and the whole representation had, as we say, neither head nor tail? Yet such is literally the case, down to the present time, with the framework of general history. Sometimes it has been traced out without any knowledge of facts, sometimes in direct opposition to facts which had been long established by criticism. The conventional system excludes the former part of general history and displaces the latter part; the entire basis, the original type of the restoration, is false and positively absurd." And again (vol. v.), "The computation of time by years of the world, even for the pre-Christian history, being as absurd and irrational as it is for the epochs of the earth and

the universe, must be abandoned as the unscientific assumption of rabbins and scholastics, which has grown into a wilful mischievous falsehood, in the face of the annals of nature and of mankind."

Our *fifth* proposition therefore is, that as concerns man's antiquity, neither tradition, monumental remains, nor written history, afford any certain or reliable information beyond a few thousand years; but that we may safely infer, from the slow rate at which nationalities are evolved and civilisation developed, an existence for the human species immeasurably beyond that of the commonly received chronology. We admit that new nationalities and races may be evolved at very different ratios, according to the geographical conditions under which they are placed; but the most prejudiced in favour of a limited chronology must allow that six or seven thousand years seems too short a period for the evolution of the civilised races, with different forms and features, different languages, different religions, different architecture, and different laws and customs, that have successively appeared and disappeared in the old world, to say nothing of the uncivilised and prehistoric peoples that must necessarily have preceded them.

## GEOLOGICAL RELATIONS.

Relative Chronology of Geology—Nature of Geological Evidence—Ages of Stone, Bronze, and Iron—High Antiquity of Man in Western Europe, as evidenced by Remains of Human Art—Higher Inferential Antiquity in Asia and the East—Our *Sixth* Proposition.

SEEING then, that so little certainty respecting the antiquity of man is to be obtained from historical sources, we shall now inquire what light geological investigation has recently thrown on the subject, and especially on the relative chronology of those races that preceded all history. It is obvious that in every country we pass backwards, from the operations of to-day to those of our ancestors, and from these, so far as they are recorded, to those of which we have no written account, and which are evidenced by architectural ruins, sepulchral monuments, and other remains of art. Even from these we can carry the inquiry into more primitive ages, when man, ignorant of the metals, fashioned stone implements, sheltered in caverns, subsisted alone by hunting and fishing, and

left traces of his presence in the relics of his rude feasts, and in his lost or cast-away weapons. These remains being found partly on the surface, partly imbedded in the soil, and partly covered over by sands, gravels, peat-mosses, lake-silts, cave-earths, and other superficial accumulations, belong to the domains of archæology and geology—to archæology so far as the determination of the race who left them is concerned, and to geology for an approximation to their relative antiquity. We say, *relative antiquity*, for geology, carrying the investigation beyond the limits of history, can assign no dates in years and centuries, but simply state the relations in time that one event bears to another event. Thus, the remains of an animal found at two feet under the surface of a peat-moss must be much more recent, considering the slow growth of peat, than those of another animal occurring at the depth of twenty feet; but as there is no determined ratio for the growth of peat, the geologist cannot affix a date to either relic, nor say how much in years the entombment of the one preceded the entombment of the other. Again, an animal like the great Irish deer, unnoticed in history, must be regarded as prehistoric and of high antiquity, and any human remains found in unmistakable connection with its bones, must be considered as contemporaneous. But, as we have no assignable chronology

for the Irish deer, so we can have none for the human remains, and can only consider their antiquity in relation to other geological events that took place before or came after them. Or let us take Herculaneum and Pompeii, which in a certain sense belong to the domain of geology. Had there been no record of the entombment of these cities, we could only, by a comparison of their works of art, have arrived at an approximation of the time when they were overwhelmed; and had these remains borne no resemblance to anything of Roman, Greek, Etruscan, Phœnician, or Egyptian art, then we must have assigned to them a date prior to any of these nationalities, and consequently of unknown antiquity. Or further, if shells now living in the Greenland seas be found occurring in British clay-beds, it would indicate that at some former period a climate similar to that of Greenland prevailed over British latitudes, for we have no reason to suppose that the relations of life to external conditions were ever otherwise than at present; and as climatic changes depend on the slow oscillations and distributions of sea and land, an immense time must have elapsed since those boreal shells lived in British waters. How long that may have been in years and centuries geology makes no condescension, but contents herself in the meantime with a relative chronology.

It may be true that some geologists, overstepping the limits of legitimate deduction, have attempted to assign absolute dates to certain prehistoric events, but such cases are exceptional, and not generally homologated by the cultivators of the science. Did peat-mosses always increase at the same rate, and river-silts and cave-earths accumulate at the same ratio, the age of any imbedded relic would be a matter of the simplest calculation; but as we have no fixed rate of increment, the most pains-taking investigation in matters of this kind can only be received as a sort of approximation. No doubt, where the rate of progress has been ascertained not for one year but for a series of years, the approximation to dates must become very close, and such calculations are as much entitled to acceptance as life-statistics or other well-ascertained averages; but in the meantime geological observations have been neither sufficiently long nor sufficiently accurately made, and all that can be safely done is to abide by a relative chronology. We may not be able to assign to any event a date in years and centuries, but we can say, judging from the known operations of nature whether it could have possibly taken place within the lapse of six or of sixteen centuries, and this, however little, is always some approach to a satisfactory conclusion. If we cannot give facts, we can at least correct assumptions, and next to the value of positive know-

ledge is the power of exposing the fallacy of that which is merely assumed.

In the case of geology this power must rest mainly on the nature of the evidence which the science can adduce, and this evidence, though inferential in its character, is, when based upon well-observed facts, as certain and reliable as anything connected with human testimony can be. We find, for example, in certain caverns, the bones of various animals imbedded in the calcareous earth that has accumulated on the floors. On breaking up this stalagmitic crust we discover that many of the bones have been gnawed, and that some, and especially the hollow ones, have been split up into longitudinal splinters. We ascribe the gnawing to den-frequenting carnivorous animals like the hyæna, and the splitting to human instrumentality, as we know of no other creature save man capable of so manipulating. These inferences are of themselves sound and reliable; but they amount to absolute certainty when on further examination we discover the hardened and peculiar excrement of the hyæna, and the stone hatchet of the rude marrow-sucking savage. Supposing that no implements had been found, and that doubts existed as to the splitting of the bones, we find on still further research ashes and fragments of wood-charcoal scattered through the stalagmite, and then the presence of man in these

caverns becomes at once an established certainty. No creature save man lights a fire, no creature save man ever lighted one; and the testimony of these wood-ashes as to the existence of a cave-dwelling race is as conclusive as if we had witnessed their grimy countenances lighted up by the fires of which these fragments were the latest embers. Or again, suppose we are excavating a canal along some level plain, and pass through first a layer of soil, then a bed of peat, next a layer of shelly marl, and lastly through a stratum of clayey silt, the obvious inference is, we are cutting through the sediments of some ancient lake—the silt, the shell-marl, and the peat-earth marking its successive stages of filling-up and obliteration. Of these stages we have no chronology in years, but were Roman remains found imbedded in the peat, and tree-canoes in the silt beneath, these would prove that some two thousand years ago the place was in the condition of a marsh, and that long before—it may have been thousands of years before—it was the site of a lake over which the early inhabitants of the country paddled their rude canoes. We arrive at the first inference from our knowledge of the time our country was invaded by the Romans, and at the second from our equally certain knowledge of the slow rate at which lake-silts accumulate and shell-marls are formed. Such is the nature of geological evidence,

and when the facts are rightly observed there need be no more hesitation in accepting it than in receiving any other kind of testimony the earnest and honest can offer.

Understanding then the nature of geological evidence and geological chronology, let us next inquire what light has been thrown upon the antiquity of man by recent researches among the superficial accumulations of Western Europe. We say Western Europe, for as yet this is the only region that has met with anything like attention from geologists, though other regions may, and in all likelihood will, contribute a richer harvest, and give evidence of a still higher antiquity. In passing from the historic to the prehistoric in Western Europe, sepulchral mounds, sculptured monoliths, and other kindred monuments, first demand the attention of the antiquarian and geologist. Many of these are clearly of vast antiquity, but people who could sculpture huge monoliths and transport them often for considerable distances, must have made some progress in the mechanical arts, and must, in the ordinary course of events, have been preceded by others more primitive and less advanced. The same may be said of the lake-dwellings which have recently received such minute and pains-taking attention from the archæologists of Switzerland. People who were capable of erecting pile-works and

platforms for huts, who wove cloth, domesticated animals, and had some simple forms of agriculture, were by no means in the earliest stages of savage life; and though they may have passed through the successive stages of using stone, bronze, and iron implements, still, the fact of their settling in communities and erecting permanent dwellings does not entitle them to be regarded as the earliest inhabitants of the district.* Man's beginnings in every country are rude, scanty, and easily effaced. Few in number as compared with other animals, wandering hither and thither as the chance of food impels, sheltering in

* These lake-dwellings, known as *Pfahlbauten* or "pile-dwellings" in Switzerland, and as *Crannogues* in Ireland and Scotland, have recently received much attention from archæologists. In the older Pfahlbauten of Switzerland the implements are chiefly of *stone*, and associated with the castaway bones of the deer, boar, and wild ox; in those of intermediate age *bronze* implements prevail, associated with the bones of the domestic ox, pig, and goat; while in the more recent, *iron* swords and spears have been found, accompanied by carbonised grains of wheat and barley, and with fragments of rude textures woven of flax and straw. The more recent seem to have been anterior to the great Roman invasion of Northern Europe; the more ancient may be many thousands of years older than that event; but on the whole they cannot be said to afford satisfactory evidence of the high antiquity which has been assigned to them by some continental inquirers. For a compendious and instructive account of these pre-historic habitations the reader may refer to Dr. Keller's *Lake Dwellings of Switzerland*, translated by Mr. Lee in 1866.

caves where these occur, or under temporary screens of leaves and branches where caverns do not exist, savage men can leave but slender traces of their presence—a dropt tool or the fragment of a skeleton being for the most part the only evidence of their existence. It is long before he becomes acquainted with the use of the metals, and even when he has learned their value, the softer and more easily worked come first, the harder and most difficult of reduction from their ores come latest. It is in this way that archæologists speak of the ages of *stone*, *bronze*, and *iron*—the use of these materials marking the comparative stages of civilisation, and forming a rude scale of time whereby to judge of the relative antiquity of a people. Of course this scale must be applied to the same people and within the same country, for one race may be working iron while another is still employing stone, just as at the present day the South Sea Islander polishes his stone chisel or hatchet, while the inhabitants of Europe are fabricating their implements and machinery of iron. But when restricted to the same people, and applied judiciously, this chronological scale of stone, bronze, and iron, gives a fair approximation to relative antiquity, and as such may be safely relied upon.

Applying it to Western Europe, we pass from the sculptured monoliths, sepulchral barrows, and lake-

dwellings, which give evidence of the use of iron and bronze, back to others of the same class with which stone implements alone are associated, and from these still backward to shell-mounds (savage feasting relics), cave-dwellings, lake-silts, and river-drifts, in which all the implements are of stone and often of the rudest description. The monoliths, barrows, and lake-dwellings may carry us back three, four, or five thousand years, but these .shell-mounds,* cave-earths, and river-drifts lie far beyond this—as far, or perhaps further, than the former are removed from the present day. In the older mounds, cave-earths, and drifts, no finely-fashioned implement of stone, but merely the trace of metal has been discovered, no polished or

* These shell-mounds—the *Kjokken-modding* or Kitchen-middens of the Danes—are found in abundance along the shores of Western Europe, and consist chiefly of the castaway shells of the oyster, cockle, periwinkle, and other edible kinds of shell-fish. They greatly resemble heaps of shells formed by the Red Indians along the eastern shores of the United States before these tribes were extirpated. The "Kitchen-middens" of Europe are ascribed by archæologists to an early people unacquainted with the use of metal, as all the implements found in them are of stone, horn, bone, or wood, with fragments of rude pottery and traces of wood fires. All the bones yet found are those of wild animals, with the exception perhaps of the dog, which seems to have been domesticated. For full details of these "shell-mounds," as also of the prehistoric "lake-dwellings," "earth-mounds," and "cave-dwellings," the reader may refer to Lubbock's *Prehistoric Times*, as yet the most compendious English work devoted to these archæologico-geological subjects.

roughest and rudest tools of flint, chert, or other hard rock, and only distinguishable from naturally-formed fragments by their determinate shapes, and the chippings for that purpose to which they have been subjected. Such primitive implements have been found in the river-drifts, lake-silts, and cave-earths of England, France, Belgium, and other European countries, under conditions that imply great changes in the physical arrangements of these countries, and, as extensive geological changes require long periods for their accomplishment, a consequent high antiquity for the contemporaneous tribes who fashioned and left them. We have some idea of the time when iron and bronze were respectively introduced into Western Europe; we occasionally find a commingling of bronze and iron, or in other words, the age of bronze overlapping the age of iron; and we also here and there discover the age of finely-formed stone tools overlapping that of bronze; but with regard to these ruder implements we have no standard of comparison—no idea of their epoch save what can be gathered from the change of physical conditions since their entombment, or the character of the organic remains imbedded along with them.

When we investigate the physical conditions, we find lake-silts—clays, marls, peat-earths, etc.—often of great thickness, and which, judging from the known

rate of lacustrine sediments, must have taken thousands of years to accumulate; cave-earths and stalagmitic incrustations, which, considering the slow increase of calcareous oozings, must also have taken long ages to augment to several yards in thickness; and river-drifts, now so high above the eroding stream, and in valleys so altered in their outlines, that hundreds of centuries must have elapsed in the work of erosion, transporting, assorting, and re-eroding, of the shingly and gravelly debris. There is no getting over these facts—no calling in of cataclysms, no sheltering under appeals to greater activity of agency in former ages. Cataclysms may assist in the rapid alteration of river-courses, but they cannot produce stalagmite in caves, lay down finely-laminated sediments in lakes, or promote the growth and decay of marl-forming shell-life in lacustrine waters. Greater activity of physical agency may produce vaster results in shorter periods, but no activity of this sort can be applied to the usual term of life—to the reproductive growth and decay of the myriad generations of plants and animals imbedded in these formations. But granting the physical evidences were unsatisfactory, what shall be said to the remains of extinct species of ox, of reindeer, musk-ox, Irish deer, mammoth, rhinoceros, and other extinct animals, occurring in these lake-silts, river-drifts, and cave-earths, and unmistakably the contemporaries, and

in many instances the victims, of the rude implement-makers of Western Europe? All that we know of animal life tends to the belief that new species require ages for their development; and these extinct oxen, even though occurring in the very uppermost of these deposits, necessarily imply a vast and venerable antiquity. But great as this may be, the occurrence in the south-west of Europe of the reindeer and musk-ox, animals now peculiar to boreal climates, involves a corresponding climate in the region where their remains occur; and as climatic changes are brought about by the slow and gradual oscillations of sea and land, an enormous time must have elapsed since the reindeer and musk-ox herded in the latitudes of France, and a primitive race of men feasted on their flesh, clothed themselves with their skins, and whiled away the time in carving their rude representations on their implements and utensils.* Still earlier than these, and far more remote, are the remains of the great Irish deer, the hairy elephant or mammoth, and the woolly-haired rhinoceros, remains of which lie in juxtaposition with the rude flint hatchets and spear-heads of the first-known inhabitants of Europe. The thick hairy covering of these animals, the undigested

* Rude representations of the reindeer and mammoth have been found on the bone-relics of the caves of Southern France, and are noticed in the works of MM. Lartet, Le Hon, and others.

fragments of vegetable food found within their skeletons, and other particulars we have learned of them from their discovery in the frozen soils of Siberia, give ample evidence of their adaptation to a rigorous climate—so rigorous, that at the time they roamed over the latitudes of France and England glaciers may have come down to the sea-shores, and icebergs floated on the waters. Such vicissitudes in geographical conditions involve an enormous lapse of time, and no unprejudiced mind can review these facts without coming to the conclusion that man has been an inhabitant of Western Europe for ages antecedent to the date of the ordinarily-accepted chronology. Indeed the conviction is irresistible, "if," as has been aptly remarked by Baron Bunsen,* "the space of time during which man has existed on the face of our mother earth be measured, not by conventional notions arising out of ignorance and sanctioned by prejudice, but by facts which any one is capable of investigating who does not shrink from researches determinable with logical demonstration and mathematical cogency."

But high as may be the antiquity of man in Europe, it cannot be set down as the limit of his existence in Asia and other regions. All that we learn from history, from tradition, or from ethnology—

* *Egypt's Place in Universal History*, vol. iv.

whatever it may be worth—points unmistakably to an Oriental descent, race after race, for the inhabitants of Europe; and thus while the men of Western Europe were fashioning flint implements and combating with the difficulties of their situation, earlier races may have been enjoying the amenities of a comparatively advanced civilisation in Southern Asia. "It is not under the hard conditions of the glacial epoch in Europe," says the late Dr. Hugh Falconer, a cautious and most unprejudiced reasoner,* "that the earliest relics of the human race upon the globe are to be sought. Like the Esquimaux, Tchukche, and Samoyeds on the shores of the Icy Sea at the present day, men must have been then and there an emigrant placed under circumstances of rigorous and uncertain existence, unfavourable to the struggle of life and to the maintenance and spread of the species. It is rather in the great alluvial valleys of tropical and subtropical rivers, like the Ganges, the Irawaddy, and the Nile, where we may expect to detect the vestiges of his earliest abode. It is there where the necessaries of life are produced by nature in the greatest variety and profusion, and obtained with the smallest effort—there where climate exacts the least protection against

* "On the asserted occurrence of human bones in the ancient fluviatile deposits of the Nile and Ganges."—*Quarterly Journal of the Geological Society*, 1865.

the vicissitudes of the weather—and there where the lower animals which approach him nearest now exist, and where fossil remains turn up in greatest variety and abundance. The earliest date to which man has yet been traced back in Europe is probably but as yesterday in comparison with the epoch at which he made his appearance in more favoured regions."

Before, therefore, we can indicate the term of man's existence on this globe, geology must carry her researches to other regions—must trace his rude beginnings in Asia and Africa, and discover, if possible, the nature of the contemporaneous fauna. As yet little or nothing has been done in this direction, but the occurrence of implements of quartzite in Southern India,* similar to the flint-tools of Western Europe, demonstrate the same simple beginnings, and imply a long upward ascent from workers in stone to workers in metals, and this, be it observed, at a period ages before man had found his way westward to the caves and river-valleys of France and Belgium. If, then, history and architectural monuments in Egypt, Assyria, and Chaldæa, carry us back something like four or five thousand years, what shall be said of the time that must have elapsed between the

* Discovered in 1865, in the lateritic formation of Madras, by Messrs. Foote and King of the Indian Geological Survey.—See *Quarterly Journal of Geology.*

skilled and powerful peoples who erected them and the rude fashioners of these quartzite implements? Not only the rising from barbarism to civilisation, but the evolution of new nationalities, new languages, new religions, new styles of architecture, and all, in fine, that constitutes new phases of humanity, must have taken place; and these things, judging from the ordinary rate of progress, must have required an enormous amouut of time for their accomplishment.

But admitting that Europe was peopled by migrations from the east, and that the flint-formers of Europe were preceded by the quartzite-workers of Asia, there is still no evidence that the quartzite-men of India were the original inhabitants of the Asiatic continent. We must carry the argument of ascensive development still further, and believe that as the men of Europe were descended from those of Asia, so the Indo-European variety of our race was preceded by the inferior varieties—Mongolian or Negritian—in the order of their physical and intellectual advancement. So far as any argument drawn from language can be of any avail, it points also in this direction—the Turanian having preceded the Semitic and Arian, or more broadly and generally, the monosyllabic being older than the agglutinate, and the agglutinate than the amalgamate. "As far as the formal part

of language is concerned," says Professor Max Müller,* "we cannot resist the conclusion that what is now *inflectional* was formerly *agglutinative*, and what is now *agglutinative* was at first *radical*. The great stream of language rolled on in numberless dialects, and changed its grammatical colouring as it passed from time to time through new deposits of thought. The different channels which left the main current and became stationary and stagnant, or, if you like, literary and traditional, retained for ever that colouring which the main current displayed at the stage of their separation. If we call the radical stage *white*, the agglutinative *red*, and the inflectional *blue*, then we may well understand why the white channels should show hardly a drop of red or blue, or why the red channels should hardly betray a shadow of blue, and we shall be prepared to find what we do find—namely, white tints in the red, and white and red tints in the blue channels of speech." Indeed, no other line of argument save the ascensive will avail, and to blink this would be to throw the whole question of the unity and progression of the human race into utter and inextricable confusion. High, therefore, as may be the geological antiquity of man in Western Europe and Southern Asia, we must seek for still earlier traces in other portions of Asia as

* *Lectures on the Science of Language*, p. 318 : 1861.

well as in Africa; and even were such traces discovered, we are not to believe that the lowest existing variety may not have been preceded in later-tertiary times by others still more lowly both in physical and mental endowments.

We are aware that it is argued by some, apparently little acquainted with the physical relations of life, that it is only under the existing conditions of the globe that mankind could have subsisted, and that all the preceding geological epochs were spent, as it were, in the "preparation of the earth for the reception of the human race." It is true that all we know of the present, as well as all that geology has told us of the past, leads to the belief that life is adapted to the conditions by which it is surrounded, and further, that in the ascent of plant-life and animal-life which palæontology has revealed, there is also a mutual co-adaptation of living forms; but seeing the vast range of conditions—polar, temperate, and tropical—under which man now exists, and the extreme variety of substances on which he can subsist, and that often exclusively, there is no reason why rude races (like the Esquimaux) may not have lived on seals and fishes during the later stages of the glacial period, or even (like the South Sea Islanders) on the palm fruits of the tertiary epoch. This argument of the "preparation of the earth for man," so often

appealed to by sciolists in support of the recentness of the human race, must be extended to much wider limits than is generally supposed; and even were we to restrict it to post-tertiary times, these times have witnessed so many changes that thousands of centuries must have already passed in their fulfilment.

Honestly and unreservedly, the whole spirit and tendency of the geological argument is in favour of a high antiquity to the human race—inexpressible in years and centuries, and only to be estimated relatively to other physical occurrences. It is of no avail to appeal to the unequal operation of physical forces in time past, to cataclysms, and other similar uncertainties. The slow formation of deposits in which relics of human art have been found, the character of the contemporaneous animals, the changes in climate which these animal remains imply, and the altered distributions of sea and land which must have given rise to these climatic changes, all point unmistakably to an inconceivable lapse of time. To shut our eyes against these facts, or to attempt to explain them away in favour of any preconceived opinions as to the antiquity of man, would be to discard the clearest deductions of reason, and wilfully and untruthfully to resist conviction.

Our *sixth* proposition, therefore, is that there is

ample geological evidence of man's having been an inhabitant of Western Europe for a period vastly exceeding that of the ordinarily-accepted chronology. As all historical, traditional, and ethnological testimony points to the descent of the men of Europe from more Oriental stocks, so the fair presumption is, that the human race existed in Asia and in Northern Africa for ages anterior to its appearance in the caves and river-valleys of France and Belgium. It is true we have as yet no evidence of the ethnology of the cavern-dwellers and flint-workers of Western Europe: if they were of Mongolian origin (as some are disposed to think) it would not lessen their antiquity, and if they were of Caucasian descent it would vastly increase it, seeing that this brings into play the argument of ascensive development, of which the lower must precede the higher—the Mongol the Caucasian, and the Negro the Mongol,—thus carrying back the antiquity of mankind immeasurable ages before his appearance either on the platform of South-western Asia or on that of Southern Europe.

## GENETIC RELATIONS.

Order and Succession of Life in Time—Hypothesis of Developmental or Derivative Descent: its Proofs and Probabilities; as applicable to the Human Race; not necessarily Degrading; manner in which it should be received—Our *Seventh* Proposition.

HIGH as we may carry the antiquity of man, far back as we may trace his lowly beginnings, there still lies beyond this the question of his origin—the inquiry how, or by what process, he came into being? If it be difficult to arrive at some intelligible notion of his antiquity, much more must it be to penetrate to his origin. The glimmer which science is yet enabled to throw on this subject may be dim and uncertain, still, if it can lead to some indication, it is something gained—something for the reason to follow—till, under the broader light of increasing knowledge, it arrive at a satisfactory conclusion. It is in vain to discourage the inquiry or point to the hopelessness of its results. Man, in every stage of his existence—savage or civilised—has turned to the question, and, according to the amount of his knowledge,

has invented theories and offered opinions. Whence are we? is a question that has occurred alike to the untutored savage and the learned philosopher. The African Negro believes that his race must have had a first mother; the Red Indians that they came from the "rising sun," or east, meaning they were the adopted children of some divine personage who emanated from thence. The Thibetians believe that mankind descended from the ape; and in Borneo the myth is that man was created from the dust of the earth, and that woman was formed from the great toe of the man. The Pelasgians and Greeks believed themselves to have sprung from the ground, a belief participated in by other Eastern nations, and largely underlying the whole of the earlier and Oriental cosmogonies. In the Phœnician cosmogony, chaos is transformed into order or cosmos by thunder and lightning, and man is awakened from the earth by the rattle of the primal thunders; in the Chaldæan, Belus cuts off his own head, but the gods mingle the blood which flows with the dust of the earth, and out of this red earth man is formed, and from this origin is rational and participates in the divine reason. According to the second version of the Hebrew Genesis, Adam, the man (by some commentators said to signify "red earth"), is formed out of the dust of the ground, and Eve, the woman, is fashioned from a rib taken out of

the side of Adam; while according to the first version man is simply said to have been created on the sixth day—male and female, and in the image of his Maker. But however curious the fable, or mysterious the myth, none of them is of the least avail to science, and reason is driven, in the long run, either to abide by the belief in a direct creative act or to seek for the solution of the problem in the theory of derivative descent. To this it comes at last, and on this ground, and this alone, must the question of man's origin be combated.

If we abide by the simple, generalised statement, that in the beginning God created man, and believe that this was a miraculous act of the Creator, then it is placed at once beyond human research and scientific investigation. If, on the other hand, we regard it merely as a statement of God's working in creation, and of God's working by secondary processes, then science may humbly and devoutly approach the problem. This is all, in indicating the origin of man, that science proposes to do; and seeing that the whole animal scheme is bound together by community of plan, that physiology can trace variations in existing life, that palæontology has demonstrated variation in extinct life, and that ascent from lower to higher forms in time has been brought about by the principle of adaptive modification of structural parts

conformable to a pre-ordained plan, it is but rational and in accordance with scientific methods, that the same principles of research be applied to the genesis of man as to the genesis of other animals. We may believe in a direct act of creation, but we cannot make it a subject of research; faith may accept, but reason cannot grasp it. On the other hand, a process of derivation by descent is a thing we can trace as of a kind with other processes; and though unable to explain, we can follow it as an indication at least of the method which nature has adopted in conformity with her ordinary and normal course of procedure. We can admit possibilities, but must reason from probabilities, and the probable can only be judged of from what is already known. Than this there is clearly no other course for philosophy. Everywhere in nature it sees nothing save processes, means and results, causes and effects, and it cannot conceive, even if it wished, of anything being brought about unless through the instrumentality of means and processes. "The whole analogy of natural operations," says Professor Huxley,* "furnishes so complete and crushing an argument against the intervention of any but what are termed *secondary causes* in the production of all the phenomena of the universe, that in view of the intimate relations be-

* *Evidence as to Man's Place in Nature*, p. 108: 1863.

tween Man and the rest of the living world, and between the forces exerted by the latter and all other forces, I can see no excuse for doubting that all are co-ordinated terms of Nature's great progression, from the formless to the formed—from the inorganic to the organic—from blind force to conscious intellect and will."

On this point olden belief and modern philosophy have hitherto been at variance. Let us note for a moment some results of the contest. The primitive notion that this earth was the centre of the universe, and the sun, moon, and stars, formed merely to be its subservients, has long since, though not without a struggle, given way to more rational convictions. The old belief that the world was formed some six or seven thousand years ago has been dispelled by the discovery of numerous rock-formations, and innumerable successions of plants and animals entombed within them in the crust of the earth. The cognate belief that the land and waters separated at the beginning were the same as the existing continents and seas, has also been set aside by the clearest evidence that land and water have repeatedly changed places, and under existing forces are still gradually passing into other forms and arrangements. The kindred notion that existing plants and animals were the same as those created in the beginning, has, in like

manner, been superseded by the knowledge that thousands of species and genera, and even whole families and orders, have disappeared and been succeeded by other and higher genera and species. So also the belief that the creation of all these—planets, plants, and animals as we now behold them—was the summary work of a few days, has been supplanted by the knowledge that our earth involves in the numerous successions of her physical and vital aspects, as revealed by geology, incalculable periods for their fulfilment. And as this kind of knowledge has extended, men of science have gradually begun to inquire into the nature of the processes by which these changes have been effected, and the laws by which these processes are sustained and controlled. In this way the investigation has proceeded from the inorganic to the organic world, from the rock-formations to the plants and animals imbedded within them, and from the succession of plants and animals to the methods by which these successions are apparently connected. Nothing could be more natural, and consequently more philosophical, than this mode of procedure. And as a gradual ascent in time from lower to higher forms of life has been clearly established, and as science has no evidence of other than the operation of secondary forces in nature, so it seeks to ascribe this ascent to this kind of causation. In other

words, it tries to connect by some process of derivative descent the higher with the lower, and the highest with that which stands next beneath it.

In working out this inquiry we must, as in other cases, believe in the fixity of nature's methods, and apply our knowledge of the present to the explanation of the past. We know that life is influenced by the physical conditions by which it is surrounded; we also know that under these influences some species succumb, while others, more elastic in their nature, become slightly modified, and endure; and we further know that such variations are perpetuated by hereditary transmission. If, then, the principle of variation or adaptive modification be admitted—no matter how infinitesimal the variations may be within a given time—it must, in the long run, be capable of producing the most extensive results, and what are now regarded as varieties may pass into species, and species in process of time assume the rank of generic distinctions. We are aware it is argued on the other side that, though variation is incessantly taking place, yet there is a limit to its extent, and that in time the varieties either die out or return to the typical species. As perturbations in the planetary system have a limit, so it is contended variation in life-forms has its limit, and does not and cannot go on indefinitely. Plausible as this may seem, it is, however, the merest assump-

tion. Such variations as have been witnessed or made the subject of special research have taken place within limited periods, and under artificial aids and sameness of conditions; whereas in nature variation takes place concomitantly with change in conditions, and is thus subjected illimitably to those forces which continue to favour its divergence. This knowledge of *variation* in existing nature, and the discovery by palæontology that the lower forms of life are gradually succeeded by the higher—the invertebrate by the vertebrate, the fish by the reptile, the reptile by the bird, and the bird by the mammal—has given rise to what is generally known as the Development Hypothesis, which seeks to connect the whole scheme of life by a process of derivative descent, just as it is evidently bound together by one great structural conception.* In work-

* The Development Hypothesis, as entertained by its leading supporters, may be briefly enunciated as follows:—1. That all the germs of future plants, organical bodies of all kinds, and the reproducible parts of them, were really contained in the first germ; 2. That species were not produced by independent creation, but that, under operation of a general law, the germs of organisms produced new forms different from themselves when particular circumstances called the law into action; and 3. That these evoking circumstances have occurred in definite order, and in conformity with a great preordained plan, whereby the scheme of life has ever been kept in harmony with the ordinal rank which now prevails among plants and animals.

ing out this view, science has, of course, many difficulties to contend with. In the first place, the subject of variation in existing life-forms has not yet received sufficiently exact attention, nor has observation been extended over an adequate amount of time; and, in the second place, palæontology is so recent, and has so wide a field before it, that little more than the outline of a plan of ascent from lower to higher in time has been sketched by its cultivators. Under these circumstances some may ascribe too much to the influence of external conditions; some to the principle of natural selection, by which the weaker and less elastic succumb to change of condition, while the stronger and more elastic endure; others to the use and disuse of organs by which some members are largely developed, and others gradually disappear; and others again, while admitting all these, may believe that there are other factors in the law of development, by which the whole scheme of life is kept in the midst of incessant variation, even in consonance with a great pre-ordained plan. But however the advocates of development may differ on particulars, or how much they may admit the imperfections of the theory, they seek to establish it as the only comprehensible process by which the Creator has chosen to people this earth, at the several stages of its existence, with newer, higher, and ever-varying life-forms. This is the

trace in unbroken ascent the evolution from species to species, or from family to family. We see the principle of variation at work in existing nature; we can trace the broad outline of an ascent from lower to higher in the past—and this ascent in time in wonderful harmony with the ordinal rank that prevails among living forms; and as we know the intimate dependence of life on physical conditions, so we ascribe its variations and newer aspects mainly to the influence of external forces. Nay, more, we see the development of the whole vital plan, so wonderfully analogous to the development of the individual, that we cannot refuse to associate with the evolution of the one the conditions which we know are indispensable to the growth of the other. This, however, is all, and as science has and can have no other object than the establishment of truth, it is as frank in admitting its defects as it is firm in maintaining its demonstrations. In its attacks on the citadel of the unknown it may recoil baffled and toil-worn; but "the failures of the past only prepare for the triumphs of the future."

In the meantime, then, however zealous some may be in their advocacy of the development theory, it must be regarded more in the light of an inference than received as a scientific demonstration. Geology has not yet discovered the connecting links, as it were,

between man and the lower animals—no form or forms that can be said to stand intermediate between the lower grades of humanity and the highest known forms of quadrumana. It may be argued, as is sometimes done, that the difference between the lowest men and the highest quadrumana is not so wide as that between the highest civilised man and the lowest savage. Still, narrow as the gulf may be, science has yet no indication of any intermediate form to bridge it over—no trace of a higher quadrumane, none of a lower man than stone-fashioning, cave-dwelling savages. It is true that the areas of geological research have as yet been extremely limited and partial, and scarcely, if at all, in the latitudes assigned to the anthropoid quadrumana. It is also true that, so far as palæontology has yet given testimony, the ascensive development of the higher animals is more rapid than that of the lower, or in other words, that they pass through fewer stages into new species; and in this case the intermediate stages of man's ascent are scarcely to be expected, and even these only within those regions which are now, or have been since the tertiary epoch, the head-quarters of the higher quadrumana. And further, it may also be true, as some contend, "that nature can produce a new type without our being able to see the marks of transition, and that she can alter a whole race simultaneously with-

out its passing through the phase of development from an individual in whom the entire change was first produced."* But even allowing for these facts —and they are all of high biological significance—it were unwise in science not to admit the difficulties that beset the problem, and rash to insist on more than the general inference that, as man belongs to, and is inseparably associated with, the great scheme of life, so he must have been subject, and continue to be subject, to any law of development that may be found affecting the other members. Where the advocates of development, in the present incompleted state of their argument, assume a position much more definite, they only prejudice their cause; and where their opponents refuse to concede this much, it were simply waste of time to attempt to convince them.

Admitting, however, that the higher animals pass through fewer stages of development; admitting that large areas of Africa and Asia, where the intermediate forms are most likely to occur, are yet geologically unexplored; and even admitting man's structural modification from the species that stand next beneath him, there still remains the fact that something new has been superadded—the organisation fitted for higher functional performance, the intellect capable of im-

* *Geographical Distribution of Mammals.* By Andrew Murray: 1866.

provement and progress. On no theory of mere physical transmission or heredity can these be accounted for. The predecessor does not possess them, and could not bequeath them; the law is a mere method, and cannot of itself originate anything new; and they can only be resolved, like all the other stages in a plan of ascensive development, into new and special endowments. It is of little avail to contend, as some psychologists do, that the lower animals are gifted with intelligence as well as the highest, and that the higher intellect of man is but a necessary co-relation of his structural adaptations. The co-relation between mind and matter no one denies; but a co-relation is not necessarily a consequence, and psychology must first establish the nature of the connection that subsists between mind and structural organisation, before any argument can be drawn from this source as to intellectual development. Nor does it alter the matter to argue that among many tribes of mankind the mind, wholly given to the necessities of animal existence, is little superior to that of the brutes. The elements of improvability are there, or at all events in the human intellect; and this improvability has never manifested itself among the lower animals, which remain now as they were from their beginnings. There must be some essential difference, therefore, between man and the animals that stand next beneath

him, and it is this difference, taken in its totality, that constitutes the new special endowment in the development of the human species. That this endowment has been evolved by means operating in conformity with a great aboriginal and all-embracing plan, and not a thing brought about either by a direct and independent act, or by the ordinary course of reproduction, is the doctrine which science is trying to establish. If the development hypothesis means more than this, we cannot accept it; if it means less, natural science may cease to contend for it. "For our own part, as we have elsewhere observed when treating of the same subject,* believing as we do that life in all its relations—its incomings and outgoings in time, its modifications in form, and its distribution over space — are under the incessant operation of fixed and determinable laws, we are as free to entertain the question of vitality as we are to entertain the formation of a stratum of sandstone or the aggregation of a mineral crystal; but this we cannot do unless at every stage of our reasoning we associate a superintending with a creative intellect. And we have yet to learn wherein the variation of a natural law, or the variation of a well-known form of life—even to the ten-thousandth degree—is less an act of the Creator than the original establishment of

* *Past and Present Life of the Globe.*

that law, or the original calling of that life-form into existence." The method has no existence till evoked; the means no power unless sustained and kept in harmonious operation.

In this view the development theory as applicable to the human race is not necessarily degrading; for be man's origin direct or descensive, he springs alike from inorganic elements, partakes of the same animal nature, and all that ennobles him above other creatures belongs truly to the soul and intellect. If, in virtue of some yet unexplained process, he has derived his descent *from* any of the lower orders, he is clearly not *of* them—his higher structural adaptations and improvable reason defining at once the speciality of his place and the responsibility of his functions. It can be no degradation to have descended from some antecedent form of life any more than it can be an exaltation to have been fashioned directly from the dust of the earth. There can be nothing "degrading" or "disgusting" in the connection which nature has obviously established between all that lives; and those who employ such phrases must have but a poor, and by no means very reverent, conception of the scheme of creation. The truth is, there is nothing degrading in nature save that which, forgetful of its own functions, debases and degrades itself. The jibing and jeering at the idea of an "ape-ancestry," so often

resorted to by the ignorant, has in reality no significance to the mind of the philosophic naturalist. There is evidently one structural plan running throughout the whole of vitality, and after which its myriad members have been ascensively developed, just as there is one great material plan pervading the planetary system; and science merely seeks to unfold that plan, and to determine the principles upon which it is constructed. If there be no genetic connection between man and the order that stands next beneath him, there is at all events a marvellous similarity in structural organisation, and this similarity is surely suggestive of something more intimate than mere coincidence. Call it development, or call it what you will, it is clearly the same structural idea pervading the Creative Mind, and receiving, according to a predetermined plan of progression, certain additions in time which mark its onward and upward expansion. No ignorant jibing can deter from research into this wonderful unity of plan, no bigoted calumnies will prevent the expression of opinions which find their verification in the facts of nature. We do not advocate the development hypothesis from hostility to other beliefs or theories, for every honest effort to throw light on the history of our race should meet with respectful consideration; nor do we contend that it has yet established its claims to belief; but we are

anxious that its views be fairly stated and placed beyond misrepresentation. This is what we have especially aimed at in the preceding pages—putting the argument suggestively rather than contending dogmatically for its adoption. Surely men may discuss the merits of an hypothesis without committing themselves to its opinions; charitably they may listen to the beliefs of another without foregoing their own convictions. By no other method will human knowledge ever be increased; upon no other principle can truth ever be established.

Our *seventh* proposition, therefore, is that man's origin being placed far beyond the limits of his own experience, resolves itself into a question of natural-history research and philosophical inference; that man being inseparably associated with the great scheme of vitality, the same methods of investigation must be applied to him as to the other members of that scheme; and applying these methods—partly from physiological observation of variations in existing species, and partly from palæontological discovery of similar variations in extinct species—we arrive at the inference that there has been a gradual development of higher from lower and antecedent life-forms, and this for man as well as for other animals. And finally, that this inference of vital development, under

the operating forces of the universe, affords at once a method comprehensible by the human intellect, and in accordance with all we know of the order and origin of other natural phenomena which invariably take place through the instrumentality of means and processes. As an hypothesis, it is not upheld even by its most enthusiastic supporters, as sufficient to lead to the origin of Life; but it is raised as the only index-finger that has yet indicated, with any degree of satisfaction, the way to vital methods and to vital relationships.

Such are the relations—historical, geological, and genetic—which indicate man's WHENCE, or the measure of his antiquity and probable origin, and from which the following inferences may be drawn:—1. That we can derive no certain information respecting the antiquity of man either from oral tradition or from written history, the former being so vague and unreliable, and the latter so partial and recent—to say nothing of the absurdity of expecting history before men had learned to record, or reminiscences of time before the period of remembrance. 2. That, appealing to geology, we find in Western Europe remains of man, and of his works, in lake-silts, cave-earths, river-drifts, and other superficial accumulations, which, judging from the slow increment of

such formations, would involve a lapse of time far beyond the commonly-received chronology; and that this inference of high antiquity is greatly corroborated by the discovery of extinct animals in these deposits—animals fitted for colder climates than that of Europe, thus implying extensive oscillations in the distribution of sea and land (and consequently vast periods) by which these climatic changes were effected. And further, that, high as the antiquity of man may be in Western Europe, it does not fix the limit of his age in Northern Africa or Asia, from whence all history and tradition trace the descent of European peoples; nor does it arrest the inference that the men of Asia, ancient as they may have been, were descended from still earlier and more primitive races.

3. That, reviewing the whole animal scheme, and seeing how thoroughly, both in the living and in the extinct, it is pervaded by unity of plan, we are constrained to apply to man the same methods of research we apply to other animals, and to extend to him whatever hypothesis may be advanced to account for the origin of the others. Applying these methods, and knowing from physiology there is a principle of variation at work among existing animals, and learning from palæontology that under a similar principle of variation there has been a gradual ascent in time from lower to higher life-forms, we are natur-

ally led to infer a process of ascensive development, by which the higher spring from the lower, and the highest from those that stand next beneath them. And finally, that in this way, and under the operation of physical forces, and in conformity with a great aboriginal plan, a genetic connection is established between the whole animal scheme, and an origin assigned to man, the nature of which may be traced and submitted to the ordinary rules of scientific investigation.

# WHITHER?

## PROGRESSIVE RELATIONS.

Natural Tendency to be interested in the Future—Incessant Change and Progress in Nature—Extinction and Creation ever coincident—Higher Physical Developments—No Abatement of Cosmical Forces—Intellectual and Moral Ascension—Newer and Higher Varieties of Man—This Progression in Obvious Operation—Effect of Geological Changes—Differences among Men lessened but not obliterated by Higher Developments—Our *Eighth* Proposition.

HAVING glanced at man's *Where*, or the relations he bears to the present, and having endeavoured to discover his *Whence*, or his relative antiquity and origin, we are now in a position to indicate with some degree of probability his *Whither*, or the course that still lies before him. As it is only from the order of the present that we can judge of the operations of the past, so it is from a knowledge of the past and present, combined with the belief in nature's continuity, that we can form any intelligible conception of that which must follow. As it is a law of our nature to take an interest in that which precedes our own being, so we are similarly compelled to look for-

ward far beyond the period of our existence. As we derive most obvious benefits from a knowledge of the past, so we may secure some gratification from an indication of the future. It is extending, as it were, the limit of our being, and embracing a wider view of creation than that which naturally falls beneath the cognisance of our living existence—a glimpse beyond the threescore and ten that ordinarily rounds the period of our earthly endurance. We are ever in care and anxiety about our own individual future; can we refrain from looking into the future of our race—a future to which every act of our own is a contribution either for good or for evil—an impulse to progress, or a check to advancement?

In trying to arrive at some intelligible conception of the future relations of our race, we must be guided exclusively by what we have learned of the past, and by the belief that the methods of nature are unchangeable and enduring. Than this, reason has no other course, and when logically followed we are bound to accept its deductions. If then palæontology has determined a progressive ascent from lower to higher life-forms in the past, and physiology admits a principle of variation at work in the present, we may rest assured the process of ascensive development is still elaborating newer and higher forms for the future. All the forces of nature, physical and vital, are as

active and operative as ever, and if to them we ascribe in any degree the vital changes that have taken place, so through their instrumentality we must look for similar changes to follow. So far as science can determine, there is in nature no abatement of force, no change of method; and it were reversing every principle of reasoning to suppose that under these circumstances life had ceased to diverge or had found its culmination in man. It is true that to whatever process we ascribe the introduction of new species, its operation is so slow and gradual, that centuries may pass away before its results become discernible. But no matter how slow; time is without limit, and if we can trace a process of variation at work, it is sure to widen in the long run into what are regarded as specific distinctions. It is no invalidation of this argument that science cannot point to the introduction of any new species within the historic era, for, till within a century or so science took no notice either of the introduction or extinction of species, nor was it sufficiently acquainted with the flora and fauna of the globe to determine the amount of variation that was taking place among their respective families. Indeed, influenced by the belief that the life of the globe was the result of one creative act, men were unwilling to look at the long past which the infant science of

palæontology was beginning to reveal, and never deigned to doubt that the future would be otherwise than the present. Even still there are certain minds who ignore all that geology has taught concerning the extinction of old races and introduction of newer ones, and who, shutting their eyes to the continuity of nature, cannot perceive that the same course of extinction and creation must ever be in progress.

Nor is it any valid argument in support of an opposite view that the animals depicted on the monuments of Egypt are the same now as they were three thousand years ago, and that if a law of variation had been in operation, some perceptible change ought to have been observable in such a lengthened period. Setting aside the briefness of the time as compared with the æons of geology, and the character of the depictments upon which no zoologist could found minute specific distinctions, the great fact remains, that the animals are mainly local, and that the valley of the Nile has undergone little or no physical change for ages—those changes of external conditions, which, if not the sole cause, are at least most intimately connected with variations in vegetable and animal existences. Change the conditions: let Northern Africa gradually sink, and the sea roll, as it once rolled, over the Sahara and Libyan desert; and three thousand years hence say what might be

the difference in the flora and fauna of the conterminous highlands! In the meantime, however, our belief in progressive ascension must rest mainly on the order that palæontology has discovered in the past, and on the facts of variation that physiology admits in the existing. And it is further confirmed by the inference, that as extinctions and creations were ever coincident in the past, so the extinction of species that has taken place within the last few centuries must be followed in time by the introduction of others. In fine, unless we believe that the scheme of Life has culminated in the present orders, and that further progression is impossible—and thus were to ignore all the teachings of the past and experiences of the present—there is no alternative but to admit that as the evolution of vitality has ever been upward and onward, so it will continue to be onward and upward still.

As concerns man, this progression is sufficiently obvious from the fact that the lower varieties of his race are gradually disappearing before the advance of the higher, and the higher as gradually assuming more exalted positions, physically, intellectually, and morally. All that we learn from the history of the old world confirms the aggressive ascension of the higher and advancing nationalities, all our experience of the present points to the extinction of the inferior

varieties—Red Indian, Bushman, Australian, and New Zealander—before the spread of the European. And rapid as this extirpation has been during the last two centuries, it will be greatly accelerated by the new means of intercommunication, the introduction of machinery, and other civilised appliances that mark more especially the progress of the current century. If clothing has already brought disease to the South Sea Islander,* if the social vices of the White man have decimated the Red, and the cultivation of the wilderness destroyed the buffalo on which he mainly depends, and if neither Indian nor Australian can settle down to habits of peaceful industry,† how shall it fare with them when the steam-ship is plying along

* The South Sea Islanders maintain that colds and coughs were unknown among them till they began to clothe themselves in compliance with civilised decorum.

† "Maugre some evidence to the contrary," says Captain Burton. in his notes to Marcy's *Prairie Traveller*, "I still believe that the North American aborigines, like the Tasmanian and the Australian, is but a temporary denizen of the world, who fails in the first struggle with nature. He is like a wild animal, to be broken but not to be tamed, as the wolf can be taught to refrain from worrying, but cannot be made to act as a dog. In his wild state the Indian falls before the white man. Settled and civilised, he dies of acute disease. He has virtually disappeared from the wide region east of the Mississippi; and the same causes, still ceaselessly operating, point to his annihilation when the prairie-lands shall have become the grazing-grounds of the Western World."

every coast, and the railway and electric telegraph are spread like a network over every continent? If the limited emigration of a former century has already done so much to change the natural aspects, and influence the aborigines of America and Australasia, how shall we estimate the results of quadrupled numbers and a tenfold tide of trade and commerce? And when the white man has taken full possession of the New World, of Australia, and New Zealand, his influence will be felt (it is already felt) on the eastern frontier of the Old—on the Mongol and Malay elements of his race, which are evidently destined in turn to make way for the higher and more progressive. As he has already crossed the Atlantic, so will he cross the Pacific, carrying with him augmented energies and higher conceptions of his functional relations. We say *augmented energies*, for it is a curious fact—however we may try to account for it—that the men of North America, and especially those on the Pacific side, as well as the settlers in Australia and New Zealand, seem to acquire new elasticity of mind and muscle—a greater rapidity of progression as it were—by transference to their new localities. Be it the result of external conditions or of the interfusion of different but nearly related bloods, such is the fact, and such will be its accelerated results on the conterminous territories of

the Old World, and their old but stationary populations.

To some, this incessant extirpation of the weak, and this incessant advancement of the strong, may seem a stern and harsh law of nature; but such are the facts; and, as has been aptly observed, "it is a false sentimentalism that cannot look facts in the face—an unsound reverence that models Providence after its own fashion." The whole history of the Old World is but a record of decline and progress—the extinction of the old and effete, and the advancement of the young and vigorous. See the long procession—Chaldæans, Egyptians, Phœnicians, Hebrews, Pelasgians, Greeks, Romans, Moors, Celts, Franks, and Anglo-Saxons—the earlier ever passing out of view, and the later ever appearing, but appearing only to follow! Such has it ever been: is there aught in the present to invalidate the inference that such it will ever continue to be? To some, also, it may look more like the dreams of enthusiasm than the speculations of sober science, to hint that the millions of China, Japan, and Malay, with their old civilisations and social systems, must melt away before the advance of the white man; but the men of Europe and of North America have already planted their feet on these shores, and partial amalgamation or extirpation is only a question of time and of mental and material

appliances. There may be ebbs and flows in this tide of advancement, just as there were ebbs and flows among the old nationalities of Western Asia and Europe, but in the long run the current has ever been forward. Can we cease, with all the experience of the past, and all the knowledge of the present before us, to believe that the current will continue to be forward still?

Nor can progress stop with the white man. In virtue of the great law of cosmical progression, the white will be superseded by higher varieties, and the man of the future will excel the man of the present, even more than the most exalted European philosopher excels the wretched Bushman or Andamaner. Nor will this ascent be restricted to his physical nature merely, for the nobler varieties have hitherto been the more intellectual, and thus things impossible and incomprehensible now will in the future become possible and easy of comprehension.* To gainsay this were to

* Participating in this opinion, but applying it to his own special field of study, Professor Owen has the following in the preface to his *Comparative Anatomy and Physiology of the Vertebrata*:—"In the lapse of ages, hypothetically invoked for the mutation of specific distinctions, I would remark that man is not likely to preserve his longer than contemporary species theirs. Seeing the greater variety of influences to which he is subject, the present characters of the human kind are likely to be sooner changed than those of lower existing species. And with such change of specific

affirm that physiologically the homologies of the vertebrate skeleton had been exhausted in the structural adaptations of man, and to deny that psychologically the co-relation of a nobler intellect with a higher organisation was impossible. It were to contradict, moreover, all human experience, for whatever we glean from history or learn from the present points to the spread and progress of the higher and the disappearance of the lower—and with the spread of the higher, more exalted conceptions of man's relations, and the gradual improvement and amelioration of humanity. It is true that the highest and most civilised nations have yet much to learn, much vice to combat with, and much misery to assuage; but surely no one will contend that the civilisation of the nineteenth century not only excels all that went before, but embraces a wider and ever-widening area. It is true that, in the intercourse of man with man, envy, jealousy, desire for supremacy, and other evil passions, may still exist; but as education and refinement prevail, these passions are more and more curbed, and assume less repulsive forms of manifesta-

character, especially if it should be in the ascensive direction, there might be associated powers of penetrating the problems of zoology, so far transcending those of our present condition as to be equivalent to a different and higher phase of intellectual action, resulting in what might be termed another species of zoological science."

tion. It is true, also, that in the intercourse of nation with nation, contentions and wars still unhappily exist; but with every stage of civilisation the greater becomes the desire to avert misunderstanding; and even the very instruments which science invents for protection or for destruction become the means of divesting warfare of much of its protracted miseries and brutal barbarities. And as this and other ameliorations have come exclusively with the newer and higher race, so in the future will higher and higher stages be attained by newer and still more exalted varieties.

Nothing stands still. All that we perceive in external nature is ever and incessantly passing into newer and other phases; all that we have learned of past life marks an ascent from lower to higher and higher forms; all that we can gather from history marks a similar mutation and progress in the intellectual, social, and moral relations of man. Races may come and go, nationalities may rise and fall, but still the aggregate movement of humanity has ever been onward and upward. We may point to Babylonians, Egyptians, Phœnicians, Greeks, and Romans, as attaining each to exalted stages of civilisation; but the later ever evolved some new phase unknown to those who went before, and exercised a wider, if not a higher, influence. Nothing

has stood still. Art and science, literature and philosophy, ethics and religion, have all alike partaken of this onward and upward development: shall we cease to have faith in their future ascension? As stone gave way to bronze, and bronze to iron, so have simple hand-implements given place to self-regulating machinery; and, as in matters of mere mechanical handicraft, so in the matters of the intellect and reason—in science, literature, philosophy, and social polity. Look at the old monosyllabic languages of Eastern Asia, and compare them with the facile and inflectional tongues of Greece, Rome, and Western Europe; at the cumbrous system of symbol and hieroglyph, as compared with the lettered literature of modern times; or at the slow, uncertain, and restricted literature of manuscript as compared with that of the printing-press,—and the argument should require no further illustration. Even in that which is regarded as the highest distinguishing feature in man—his religious sentiments—there has been a similar and upward development. From Feticism to Pantheism, from Pantheism to Judaism, and from Judaism to Christianity, we can trace the ascent; and even now, under the various phases of its profession, Christianity itself is gradually obtaining a purer practice and wider recognition. Nothing stands still; and not to believe that the existing

varieties of mankind will pass away, and the highest be superseded by others more highly organised and more nobly endowed, would be to shut our eyes against all the teachings of the past, and obstinately to resist the clearest deductions of reason.

We are aware that many, influenced by old beliefs, regard the whole scheme of vitality as culminating and terminating with their own race. In their view creation was an *act* rather than a *work*—a thing accomplished within a given time rather than a process which has been going on from the beginning and is still going forward. As man was the latest effort of creation, so to their minds he must be the last; and as he was formed, according to the Hebrew cosmogony, "in the image of his Maker," so none other can transcend him. But to what section of mankind shall we apply this statement? To the dusky Negro or to the fair Caucasian? to the savage Australian or to the enlightened European? As a broad generalised demarcation between man and the lower animals, this statement, which is only in harmony with the whole anthropomorphising tendency of the Hebrew cosmogony, may be received without dissent; but as implying a limit to creative law it was never meant and cannot be accepted. Physically and mentally there are vast differences between existing races, and consequently equally wide capabilities of rising to

higher stages. These differences, if they mean anything, refer to periods—periods of time, each characterised by its own variety of man, just as they are palæontologically characterised by their own special floras and faunas; and of course conforming to the great law of cosmical progress, by which the latest is ever in ascent of that which preceded it. Losing sight of this law, and of the immense differences that exist between the different varieties of mankind, other theorists, and among them Professor Agassiz, "think it can be shown by anatomical evidence that man is not only the last and highest among the living beings of the present period, but that he is the last term of a series, beyond which there is no material progress possible in accordance with the plan upon which the whole animal kingdom is constructed; and that the only improvement we can look for upon earth for the future must consist in the development of man's intellectual and moral faculties."* Where, however, is the anatomical evidence? Can we believe that the adaptive modifications of the vertebrate skeleton have been exhausted in the structure of man? Are there no structural differences between the Negro and the Caucasian? Were there no differences between the innate powers and conceptions of the races who raised earth-mounds and those who piled up pyramids?

* *Essay on Classification*, pp. 34, 35.

nothing ethnologically at variance between those who reared the heathen temples of the East and those who erected the Gothic cathedrals of Western Europe? Was there no difference of power in the eye of the Egyptians and the eye of the Ancient Greeks to judge of beauty and proportion in sculpture? Is there no difference between the eye of the Mongol and the eye of the European in their respective capacities for perspective? As there are undeniably immense differences between existing races, and as some of these differences have been evolved even within the historic era, so we may rely on analogous developments in the future, and agree with Professor Owen that, "seeing the greater variety of influences to which man is subject, the present characters of the human kind are likely to be sooner changed than those of lower existing species."* If there can be no material progress in the future, how shall we account for the material differences that exist? If there is to be only intellectual and moral development, how shall we explain the fact that the higher attributes of mind have never manifested themselves unless coincidently with the rise and progress of newer and higher races? As physical and mental endowments have ever been

* *Comparative Anatomy and Physiology of the Vertebrata.*—Introduction.

concomitants in the past, so we may rest assured the one will accompany the other in the future.

Look at the long historical past of the Old World races—Turanian, Khamite, Semite, and Aryan. See how gradually but progressively the one displaced and superseded the other. More exalted in physical form, more fertile in ideas, more complex and expressive in language, less material in religious sentiment, more generous in morals, more uniform and brotherly in social polity, the newer ever advanced, and the older and inferior ever declined. For the last five thousand years the historical platforms of Central and Western Asia, of Northern Africa and Europe, are replete with evidence of this material, mental, and moral progression, and to him who fails to comprehend the purport of the past it were fruitless to endeavour to indicate the course of the future. As nationality has superseded nationality, and race succeeded race, so will variety supersede variety, and this as a cosmical necessity, so long as the existing order of nature endures and the forces through which it is manifested remain unimpaired. Palæontologically or historically, nature has never repeated herself; and where there is no repetition there must be declension or advancement. If there has not been declension—and the most strenuous opposer of these views will scarcely venture on

such an assertion—there must have been, as there will continue to be, advancement and progress.

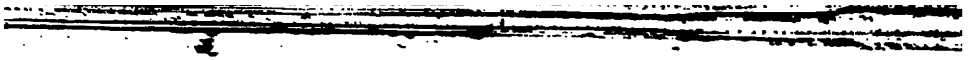
We are aware it may be argued, that as geological changes are ever bringing about new distributions of sea and land, and consequently new external conditions, so human progression in the future might be accelerated or retarded, just as these conditions were favourable or unfavourable. The objection is not without its significance, and can only be met by reference to the past; by reasoning that as the course of life during all the geological mutations of the world's past has ever been ascensive, so it will continue to be ascensive in the future. It may also be observed that as man has a world-wide distribution, and as all oscillations of sea and land are slow, and gradual, and local, so their influence on his progression during any epoch can only be partial and restricted. It may be further noticed, though the laws which regulate the distributions of sea and land be altogether unknown, that the growth of existing deltas and the activity of vulcanism chiefly within the lower latitudes, leads to the inference that the lands immediately following the present will be in warmer zones, and thus afford, other things being equal, a more congenial home for man's development. But be this as it may, our indications of the future must depend mainly on our knowledge of the past, and on our faith in nature's continuity,

and these point broadly and unmistakably to uninterrupted ascension.

It may also be questioned, and has, indeed, already been questioned, whether any one variety of man, however highly organised or nobly endowed, could be truly cosmopolitan; or, in other words, whether the white man—all the others being extinct—is fitted to inhabit and make progress alike under every clime and every latitude? This objection, put in the form of a question, is easily met and replied to. No advocate of progressional development has ever contended for universal uniformity of race; no one knowing the physical causes that are ever tending to produce variety could entertain the notion that present progress would terminate in the obliteration of racial distinctions. The whole history of the past is marked by the existence of races and varieties; every stage of human progress has been characterised by higher and lower; and so long as climate, physical surroundings, and other influencing conditions continue to differ, so long will ethnic differences prevail among mankind. These differences, taken in their totality, may become less and less at every succeeding era of progression; but tropical, temperate, and boreal conditions—favourable and unfavourable—will ever continue to stamp their impress; and all that can be fairly indicated is, that mankind will rise higher and

higher at each successive stage, and that the more they advance the fainter will become those differences —physical and moral—which now characterise so broadly existing varieties.

Our *last* proposition, therefore, is, that as there has been an obvious ascent from lower to higher in the past, and as all the forces of nature, physical and vital, upon which that ascent depended, are still in full and harmonious operation, and evince no symptoms of decay, so there will be a similar progressive ascension in the future ; and that, as man has ever partaken of this ascent, structurally and intellectually, as is amply evidenced by the history of his race, so will existing varieties pass away and be superseded by others more nobly constructed and more divinely endowed.



# CONCLUSION.

# CONCLUSION.

Summary of the Argument—Its Practical and Scientific Bearings —Opposition unavailing—Prospect of its Adoption.

SUMMING up our inquiry, the question of man's Where, Whence, and Whither, resolves itself into this:—

1. That, *Zoologically*, man and other animals belong to the same vital scheme; that this scheme is based on a determinate and pervading plan; that adaptive modification of structural parts seems to be the principle according to which the higher and more complex forms are evolved from the lower; and that this connection establishes relations between him and his fellow-creatures that are inseparable.

2. That, *Geographically*, man, like other animals, is influenced by his physical surroundings; that these influences extend alike to his material and mental nature; that they are important factors in the production of variation among mankind; and that, taken in connection with the principle of adaptive modification, they afford some indication of the methods through which vital development is effected.

3. That, *Ethnologically*, man appears in several great varieties distinguished by mental as well as by physical characteristics; that the study of these characteristics leads us to regard some as higher and others as lower in the scale of being; that, judging from all we can learn from history, tradition, and analogy, the higher must be the more recent and the lower the more ancient varieties; and that, carrying out this principle of descent, the lowest known variety may have been preceded by others lower and lower in proportion to their antiquity.

4. That, *Functionally*, man, like other animals, has his relations to external nature the requirements of which are imperative; that, being endowed with higher mental as well as with higher structural capabilities, he exercises a wider influence on vitality than other animals; that in virtue of this influence, and according to his civilisation, he extirpates, disseminates, and modifies plant-life and animal-life; and that in proportion to his superiority he in like manner modifies his own race, the higher ever passing over the lower, and the earlier ever disappearing before the spread of the recent and advancing.

5. That, *Historically*, we can have no certain evidence of the outcomings and incomings of those early races which preceded all history; that, even were tradition reliable and history certain, it is as

impossible for the race as it is for the individual to trace itself back to its origin; that we can only arrive at a notion of man's antiquity by inductive reasoning from the evolution of nationalities, the growth of language, and the progress of civilisation; and that this induction for all prehistoric time must be founded exclusively on the discoveries of geology.

6. That, *Geologically*, there is the amplest evidence of man having been an inhabitant of Western Europe for ages preceding the popularly-received chronology; that man's occupation of Europe does not fix the measure of his antiquity in Northern Africa and Asia, to which everything points as the region from which the races of Europe were descended; that the discovery of prehistoric remains in Asia could not be received as the earliest of indications of the human race, but that geology must seek for the earliest traces of man in the regions that are now occupied by the lowest varieties—thus implying an antiquity for the human species that cannot be expressed in years and centuries, but only relatively to other geological events.

7. That, *Genetically* man must deal with his origin as he deals with his other natural-history relations; that as he is inseparably associated with the great scheme of life, so he must apply to his own species whatever genetic process he may seek to apply to his

fellow-creatures ; that if there be a plan of progressive development such as natural science has been recently striving to establish, by which the higher forms of life have been gradually evolved from the lower, then man must seek for his origin in the same course of development ; that this hypothetical process, as applied to man, does not involve anything either degrading or materialistic, but is simply an effort of science to present some comprehensible indication of the creative method, which, so far as we can perceive, works only through means and processes ; and that though the process could be proved to demonstration, it would still leave untouched the plan to which all the ascensive orders of life have ever conformed, and which can only be resolved into the will of the Creator.

And lastly, that, *Progressively*, the whole history of the past as well as the experience of the present point to an upward ascension of vitality ; that all the forces of nature with which this ascension has been associated, or upon which it depends, being as active and operative as ever, we may fairly infer a corresponding progression in the future ; that in virtue of his higher nature the progression will be more rapid and perceptible in man than in the lower animals ; and that physically, intellectually, socially, and morally, the developments of the future will transcend the man of

the present, as far as the man of the present transcends all or any of the varieties that ever went before them.

Such are the conclusions to which our inquiry legitimately leads, and which, when rightly viewed, have practical as well as mere theoretic bearings. We say *practical bearings*, for no subject, however novel or sensational, can secure a position among the sciences, or excite a general interest, unless it has something real and practical to recommend it. "Philosophy," as has been well said, "is never more exalted than when she stoops to administer to humanity." From a knowledge of our zoological relations, then, we may learn more fully the nature of the bond that connects us with our fellow-creatures, and the offices towards them we are bound to perform. Linked to them by the closest biological ties, yet raised above them by higher physical and mental adaptations, we have manifestly duties towards them; and these duties must surely have a deeper significance to the mind of one who knows all this, than to the mind of another who remains unfeelingly ignorant of the relations that connect him with the rest of vitality. What are equally with ourselves the objects of God's care cannot surely be beneath our consideration; and the more intimate and intelligent this consideration, the better will we be enabled to shape

our conduct towards them in harmony with his intentions. From our geographical relations we may perceive how much we are influenced by external conditions, and that these influences should not be lost sight of, either as regards the physical or mental peculiarities of individuals or of nations. What is possible for one race under the impress of physical surroundings, may be impossible for another under different influences; and what may be suited to the genius of one nation, may for the same reason be abhorrent to another. How absurd, therefore, to look for uniformity where nature has stamped with indelible dissimilarity! How unjust, in our international relations, to exact alike where nature has denied the means of equal fulfilment! From the study of our ethnological relations, we may learn to direct more wisely, and in accordance with nature's intentions, our schemes of territorial acquisition, civilisation, and enlightenment. All races, as well from their inherent natures as from the nature of their position, cannot be dealt with alike; it were waste of energy to attempt civilisation where nature has denied the capability, and it were surely wiser to remove the obstacles to improvement where improvability exists, than to seek for improvement where experience has told us it is hopelessly impossible. Without a philosophic conception of our functional relations to ex-

ternal nature, to God, and to our fellow-men, we are living merely by temporary shifts and expedients, which lead to no satisfactory progress and consequently to no enduring results. If nature has rendered certain duties inevitable, let us strive to know what they are, and the better we know them the more thorough will be their performance. It is simply because we will not look at these functions as nature intended, that human conduct, individually and collectively, is little better than a track of doing and undoing, of blundering and reparation. Again, from our historical relations we may learn how uncertain is all that relates to the early history of our race, and how recent is every statement that can be received as certain and reliable. It teaches as strongly as anything can how little reliance is to be placed on tradition, and how critically exacting it is necessary to be in all that relates to historical evidence. From our geological relations we may presume the vast antiquity of our species, determine how gradual the ascent has been from barbarism to civilisation, and learn how vain it is to expect that anything in human progress can ever be attained save through slow and piecemeal stages. Were this consideration more frequently taken into account, it would lead us to be less ardent in our hopes of progression, and more hopeful of progress, in spite of all the doubts, delays,

and difficulties that are ever obstructing. From a indication of our genetic relations we may gain new insight into the Creator's methods, and discover how endlessly varied the results Omniscience can elaborate from the same primal elements; while from our knowledge of the community that subsists between all being, we may learn to cultivate a community of feeling, and to view nothing as mean and degrading save that which, unmindful of its higher position, by vice and criminality degrades itself. And lastly, from a consideration of man's progressive relations we may be led to newer and higher aspirations, not only after individual attainments, but after all that can contribute immediately or remotely to the ascension of the race. A mere round of reproduction, sameness, and decay, has little ennobling in it; an incessant onward and upwards inspires with newer and higher efforts. It is something to be conscious of sustaining well our part in the present; it is something more to feel we are bequeathing our gift to the future, and living, as it were, beyond the period of our own individual existences.

To those who have accompanied the author through this brief review, it must now be sufficiently obvious that there is nothing in the question of man's Where, Whence, and Whither, that places it beyond the legitimate domain of scientific inquiry—nothing

that earnest minds may not discuss with freedom, and honest words convey without restraint. As a problem of natural history it must be solved by natural-history methods; and, however uncertain the conclusions yet arrived at, they are, like those resulting from every earnest and truth-seeking effort, entitled to a candid consideration. That they run counter to old beliefs may be sufficient reason why they should be narrowly scanned and received with hesitancy, but it is no honest cause why their tendency should be misrepresented and their advocacy be traduced. Our beliefs are ever according to the measure of our knowledge; and as the knowledge of our biological relations becomes more intimate, and the nature of our geological relations more fully established, so will the new beliefs respecting the origin, antiquity, and destiny of man gain a wider acceptance. It is the old warfare with ignorance and prejudice; the old combat between rational inquiry and traditional faith: need we indicate with what side the victory must ultimately rest? As the older beliefs in the sun revolving round the earth, in the limited antiquity of our globe, in the permanence of its seas and continents, in the sameness of its plants and animals through all previous time, in fossils being sports of nature, and a thousand others equally sincere but equally mistaken, have all passed or are

passing away, so will those now generally entertained respecting the limited antiquity, the exceptional origin, and the perdurable nature of man. Have we not already gained by the establishment of more enlightened views for the former? shall we not reap similar benefits by the substitution of more rational beliefs for the latter? Let each man answer according as he believes; and as he believes so let him try to carry conviction to the understanding of others.

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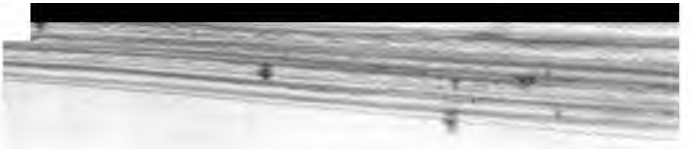

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